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The Business of Chemical Manufacture

THOSE who had the privilege of hearing Dr. Levinstein deliver the Sir William Perkin Memorial lecture must have been struck by the apparently inconsequential way in which businesses were started during the nineteenth century. We are frequently told that opportunities for youth were never greater than to-day and that those who fail to rise to great heights do so because they are inferior to their fathers. All of this may be true, but the fact remains that such opportunities as exist to-day are different in character to those open to the young man of the middle nineteenth century. It is still possible to start a small business upon the basis of a new invention and to achieve some success, but the path of the small concern is beset with difficulties that did not exist in the earlier and middle years of the reign of Queen Victoria. Would it have been conceivable, for example, that Perkin could have founded and maintained his factory when faced with the competition of established chemical firms employing large research staffs and having great financial resources behind them? Because Perkin himself appears to have been a very remarkable man, it might have been so—but his difficulties must have been immensely increased.

For those who doubt this, it is well to recall the early days of Perkin's venture as shown in Dr. Levinstein's lecture. Perkin, in 1856, and being then 18 years of age, happened to be playing about in his home during the holidays with some chemicals. We use the words "playing about" deliberately, because according to modern research standards, that is what he was doing. Instead of following the current practice and throwing away any product which was non-crystalline or coloured he dipped a piece of dry silk in the liquid and found that it possessed dyeing properties. A little further experimentation enabled him to show his discovery to others. Industrialists said it might be of value; academic chemists warned him solemnly against losing caste by making money from chemistry.

At that time even ½-lb of aniline was esteemed a great treasure, and yet this boy of 18 set out to make it by the ton. Nitrobenzene was only known in the laboratory; Perkin set out to make it also by the ton. He had no experience, no commercial advisers, no engineering department, no trained assistants; he was, we repeat, only 18, and knew absolutely nothing of industry. He had to manufacture his dye, to sell it, to discover how to apply it both to silk—which involved the discovery of the soap bath method—and to cotton—which involved the discovery of the tannin method. Later he decided, when faced by real competition, that he had had enough of business and, having made £100,000, he sold out in accordance with the commercial practice of the age. He was then 35 years old.

Dr. Levinstein's father, Ivan Levinstein, started in an almost equally off-hand fashion. He came to England at the age of 19 and began to produce magenta by the arsenic process in which he would presumably have been instructed on the laboratory scale in Charlottenburg. His "works" was a private house. We are told that he made a "parcel" of magenta in his house, sold it for cash in Scotland, having travelled there himself for the purpose; then went to Hull, where he bought some Continental aniline for cash, and took that back with him to his house for conversion into magenta. Thus did another great business start, the factory being extended as required by adding cottage by cottage.

This inconsequential foundation of businesses may be paralleled in engineering, and in many other directions. It was typical of the times. To-day, the larger concerns would soon discover these new ways of making money and, being very much alive to seize business openings, their research organisations would soon enable them to manufacture new substances and to put them on the market. While there may be reason to believe that the peculiar conditions of business in those days permitted youths to achieve success at an age when to-day they would hardly be considered old enough to be allowed to pass the Inter. B.Sc. exam., there is no doubt that geniuses such as Perkin and Ivan Levinstein brought something to their work that we stand in need of to-day. There was an individualism, a spirit of adventure that the world is losing partly because the growth of knowledge keeps many of our young men at school until an age when maturer ideas bring caution, and the adventurous spirit has gone, in most instances never to return. Perhaps we have to pay that price for increasing knowledge and increasing technical virtuosity. Let it not be forgotten that in many of his business ideas, Perkin was intensely modern, being right in advance of his times.

Biochemical research affects life itself. . . . In this branch perhaps organic chemistry may give its greatest blessing to a tortured world. Herein we may find in the end the most enduring gift wrought for us by the great adventure of this modest, unassuming, devoted man of science (Sir William Perkin).

—Herbert Levinstein.

NOTES AND COMMENTS

Calcium Carbide Production and the Special Areas

CONSIDERABLE progress in the reduction of unemployment in the Special Areas has been made in the four years since the Areas were first recognised as a national problem. The progress has been gained by the transference of people to more prosperous areas, by the partial recovery of some local industries, and by the establishment of new industrial enterprises in the Areas. This last has always been regarded as the most satisfactory method. The debate in the House of Commons this week expressed the disappointment felt in some quarters that new local industries had only been developed on a small scale. This may be true but it should be remembered that the very nature of the problem precludes the possibility of a rapid solution; the facilities offered by the trading estates have provided a useful start and they are the means for future expansion. Mr. G. Hall, in Monday's debate, made out a strong case for establishing a calcium carbide works in South Wales. He pointed out that 60,000 tons of carbide (all imported) were used in this country last year, while Germany was using between 150,000 and 160,000 tons, 75 per cent. being produced by coal power. There seemed to be no reason, therefore, why we should not be able to produce carbide (using coal) at a lower cost than that at which it was imported. He estimated that a calcium carbide works producing 60,000 tons annually would require 200,000 tons of coal and would give employment to some thousands of men.

A Cancelled Drug Auction

BEFORE the War, public auctions of drugs were held fortnightly at the Commercial Sale Rooms, Mincing Lane, and substantial quantities of the goods offered were always sold. But owing to the exceptional difficulties of obtaining drug supplies during the War, the method of direct trading between the producing and consuming countries was adopted. Gradually this method became customary and in recent years public auctions of drugs were only held about half-a-dozen times annually. But last week it was decided to cancel the auction, which would have been the last of this year's series, two days before the date announced. According to a correspondent in *The Times*, the decision is a serious one for the drug trade and is a recognition, rather tardily reached, that buyers prefer to negotiate purchases by private treaty rather than in the auction room. It would be unfortunate if producers abroad gathered the impression, through this cancellation, that London was no longer a clearing house, when, in reality, a large volume of the world's drugs are sold through London by private treaty.

The Future of the Cement Industry

UNVEILING a memorial to Joseph Aspdin, the inventor of Portland cement, at Wakefield, Viscount Wolmer, Chairman of the Cement Makers' Federation, had some interesting things to say regarding the present position and future of the cement industry. Until 1931 the output of the industry had steadily increased and although it was hit by the depression, the downward trend had been arrested in 1933. Later the establishment of the Cement Makers' Federation put an end to price-cutting; to-day the industry was disciplined, efficient and a very powerful contributor to the country's prosperity. Although there should be busy prospects ahead for such an industry, Lord Wolmer said that he viewed the future with a certain amount of misgiving. There were signs of a decrease in the consumption of cement, due notably to a diminution in the number of houses being built, but even more dangerous, he considered, was the influx of newcomers in the field. Capital to-day was seeking outlet and the price-protected cement market appeared to offer an inviting opening. The industry as it stood had a capacity in excess of 10,000,000 tons annually, while the country last year—the peak year—was able to consume only 6,600,000 tons. His reference to the influx of newcomers as " dangerous " is thought-provoking. Dangerous it might well be to insecurely founded companies and highly undesirable from the point of view of the larger concerns obtaining a big share of the business, but should the stimulus of competition be entirely overlooked? Competition is known to be productive of those technical and economic achievements which make an industry progressive; it should have the same result in the cement industry.

The Sterling-Dollar Exchange

TRADERS must have been wondering why financial journalists have in the last week or two made such a scare about the fall in the value of sterling in relation to the American dollar. Whereas the nominal parity is 4 dollars 86 cents to the pound, sterling actually went back to its lowest point of 4 dollars 62 cents at the beginning of this week. There are technical reasons for the cheapening of sterling, the most important being the prevailing nervousness on the Continent which has led foreigners to transfer balances held in London in a hurry to New York. The money market may look askance at this movement, but its interests are not necessarily those of the trader. This is more particularly true of the British manufacturer or merchant who has a considerable stake in international trade. A cheaper pound means that both are better equipped for the ceaseless battle in the over-sea markets. Great Britain, for example, has a strong pull at the moment over the United States in the huge South American market. Conversely, the tendency is for imports into Great Britain to become sensibly dearer. Even then the net result will be more British exports and fewer imports.

The Five-Day Week

NEXT April will mark the twenty-first anniversary of the five-day week, which was introduced by Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE, in the spring of 1918. At that time, the demands of War service on the civilian, including munition work, was one factor which led Sir Ernest Benn to make this innovation for the staffs of the journals published by this firm. At the same time he foresaw that the free Saturday was a development which was bound to come sooner or later with the increased output of the machine and the speeding up of production in many industries. Since the War many firms in various industries have adopted a shorter week, and there is little doubt that when the demands of rearmament can be slackened, the adoption of the free Saturday will rapidly spread. Experience has shown that any disadvantages due to shorter hours are outweighed by the benefits which accrue from better health and efficiency on the part of all the workers concerned. We should welcome information from any of our readers on the subject of the five-day week, and would be interested to hear from other firms who are already working on this basis.

Dr. Herbert Levinstein.

Sir William Perkin's Adventure and What Has Come of It*

By
HERBERT LEVINSTEIN, M.Sc., Ph.D., F.I.C.

SIR WILLIAM PERKIN in 1856 discovered a dyestuff called Mauve or aniline purple and thus founded the great industry of coal tar dyestuffs or aniline colours as they were once called. The fiftieth anniversary of this discovery was celebrated very remarkably in 1906 both in this country and in America. This year we are commemorating the centenary of his birth. This discovery and the industry created by Perkin in 1856 and the seventeen years which Perkin afterwards devoted to it were indeed decisive events in the history of both science and industry.

William Henry Perkin was the son of a small builder who had saved a little money after a life of great industry. He wanted his boy to become an architect. He was sent to the City of London School at the age of fourteen, and there he came under the influence of an excellent chemistry master, Mr. Thomas Hall. At the age of sixteen he went to the Royal College of Science and became a student of the great A. W. Hofmann.

The Discovery of Mauve

At the age of eighteen, in the early part of 1856, this youth was experimenting at home during his holidays. Aniline and toluidine, its homologue, were at that time of some interest in the Hofmann laboratories. Aniline was a rare substance. Perhaps at that time in the whole world a few dozen people knew of aniline, fewer still of toluidine. He attempted to make quinine by oxidising a derivative of toluidine with bichromate of potash. This experiment failed. But Perkin tried oxidising a simpler, similar substance.

The simplest substance of this type is aniline. Aniline gave him a very unpromising black precipitate. Perkin's master, Hofmann, never bothered with coloured substances, nor did any organic chemist of that time bother with substances that did not readily crystallise. There is no doubt whatever in my mind that any other contemporary and very many since would have thrown this dark precipitate into the sink. Perkin thought otherwise; he examined the coloured solution and actually found that it would dye silk a brilliant Mauve shade. This discovery is sometimes described as an accident because Perkin tried to make quinine and ultimately discovered something very different. It is, in fact, the least accidental of discoveries. Pullars of Perth appear to have been the first to see a sample of the dyed silk. Robert (afterwards Sir Robert) Pullar wrote back, "If it is possible to apply that in a practical way, it should be a very valuable matter."

Professor Hofmann and those with him at the Royal College of Science were, however, entirely against him exploiting the discovery industrially. Perkin himself was afraid of losing caste by engaging in commerce. Such, however, was his courage and so touching the confidence of his father that the adventure was undertaken. A small works was built at Greenford Green. All his father's savings went into the undertaking.

Rather impure aniline was his raw material. After very numerous experiments Perkin tells us that nitrobenzol seemed to be the only source of aniline. "It involved the establishment of a new manufacture, nitrobenzol at that time not being a commercial article, and though it could be produced in small quantities without much difficulty, when tons were required at a limited cost many obstacles presented themselves." Nitrations, in fact, had never before been carried out on the large scale.

Perkin soon made his nitrobenzene and pretty quickly standardised a type of nitration vessel uncommonly like those used to-day. The next stage was the manufacture of aniline, and then the oxidation of aniline to Mauve.

Dyeing silk with Mauve seemed easy because the colour had a great affinity for silk. Yet there was a difficulty in getting even, level shades. So young Perkin soon found that Mauve dyed very level shades if applied to silk from a soap bath, a method of dyeing which had never been used before but has never gone out of practice since.

But Mauve would not dye cotton without a mordant. A new method of dyeing had to be discovered before Mauve could be used on cotton, far and away the most important textile fibre in this country. So the tannin method was discovered and used in 1857. I personally have a feeling that the discovery of this method of dyeing cotton by Perkin is a more considerable achievement than the laboratory discovery of Mauve. It is applicable to any colouring matter that forms an insoluble compound with tannin, *i.e.*, with any basic colour.

The manufacture of Mauve on the large scale so soon after its discovery in the laboratory is, of course, an incomparable technical performance. Perkin originated in this way by this discovery technical service to customers, never thought of before, ever since a great feature in the aniline dyestuff industry. Calico printing too had his attention, and suitable methods of printing Mauve were quickly developed.

The speed with which the process of selling Mauve proceeded is surprising. Perkin, of course, brilliant boy as he was then, must have had a very persuasive personality. He had moreover a tremendous inner urge to scientific research and an extremely clear chemical mind, which quickly and without fuss or apparent sparkle found the right solution.

Successors to Mauve

A period of immense activity in research and production followed Perkin's discovery of Mauve in '56 and its successful launching on the market. The dyestuff we call magenta was obtained by Natanson already in 1856. The first industrial preparation was by Renard Frères, of Lyons, in 1859.

Magenta was soon followed by Hofmann's violet, Bleu de Paris and then the soluble blues and the celebrated Nicholson's blue, Phosphine, some greens, Martius yellow, Aurin and others. Lauth's violet was originally prepared in 1861 though it came on the market some years later. It is still in use.

By 1862 the value of the manufactures of coal tar dyes had risen from nothing to more than £400,000 sterling. In 1867

* From the Sir William Perkin Memorial Lecture arranged by the Society of Chemical Industry in conjunction with the Chemical Society and delivered in the Leatherseller's Hall, London, on November 24.

the turnover had risen to 1¼ million sterling although the products were then much cheaper than they had been before.

In the next year, 1868, Graebe and Lieberman discovered in the laboratory the chemical constitution of alizarin, the colouring matter contained in madder root. In the following year these two German chemists in conjunction with the great and beloved Caro, now returned to Germany from Roberts Dale in Manchester, took out a patent for its technical production. One day later Perkin in England also filed a patent for a practical method of making it. It was the beginning of the end. In 1873 the sales of alizarin by the Germans were 2½ times as great as those of Greenford Green. "The works" (says Perkin) "would have had to be made two or three times as big." Why should he do this? Big business was unknown in England. He had made the £100,000 which was the goal of most English people in business. Perkin's greatest delight was in chemical research. After seventeen years in industry at the age of 35 he sold out. To the end of a long life he devoted himself afterwards to what is called pure research.

Curiously, however, the Perkin reaction which made cinnamic acid accessible was very important in the early stages in the development of the artificial indigo industry. By his discovery of the method of producing cumarin, in a sense he became a pioneer in the manufacture of artificial perfumes. Stranger still was it that this man, who discovered Mauve and had the courage to make it on the large scale, should have been content later on to do a great deal of work on magnetic rotation. This physico-chemical work is of great difficulty but I should have thought of quite exceptional dullness for a man who had created vast industries.

After the close of the Franco-Prussian War in 1871, the third successful war waged by Germany within seven years, an immense feeling of self-confidence, push and drive aggressive enough in character inspired the German. One result was an immediate and great development in the sale of German dyestuffs in practically every part of the globe.

Impetus to German Study of Chemistry

It gave too in Germany an immense impetus to the study of chemistry. Professors such as the great Adolph von Baeyer and that most distinguished chemist Emile Fischer were glad to be associated with the great German colour factories. From von Baeyer springs the synthesis of indigo, the technical production of which followed later on, one of the greatest triumphs of chemical industry. But not only indigo, many other substances of industrial value such as the phthaleins came from the Baeyer Laboratory or those of his students. Here there was a close connection between von Baeyer, the most brilliant, academic chemist of the age, and Caro, one of the most versatile and brilliant chemists ever engaged in the dyestuff industry. Did not Perkin show the way in this? He was always in close touch with Hofmann who, like the German professors, not only discovered new dyes but found out their constitution, thus leading, as did Baeyer, to the discovery of new ones by the dyestuff chemists. Emile Fischer himself in his rare incursions into the industrial field became the joint discoverer of veronal, the first and best known of the sedatives derived from barbituric acid. And so the laboratories at universities and factories grew. The professors of pure science were glad to mix freely with the distinguished chemist attached to the German dyestuff plants. Thus arose the great chemical schools in Germany and in Switzerland and later on here in this country

It is, however, important for us to remember that at this moment the British colour works led the world in scientific and technical achievement. In the ensuing forty years they were outclassed by German achievements in this field. The German salesmen, energetic, well directed, well educated, masters of their job, obtained the orders without which industry is nothing and science merely an intellectual pursuit. It was, of course, cheaper to manufacture in Germany, that helped a great deal.

It was not the chemist nor the technologist that failed in the 41 years between '73 and 1914, perhaps not even the salesman or the direction. Perhaps it was more our social system. Certainly the chemist had very little standing, but in general business was looked down on and was not encouraged or rewarded as in Germany.

New drugs were soon discovered in the German dyestuff plants. They could be made out of the same raw materials as are used to make dyes. You may wonder why similar developments did not take place in England. The three reasons are:—

(1) The Germans early made several very lucky strikes—great money makers such as antipyrin, phenacetin and later aspirin, drugs that everybody knows. These and other preparations were sold in truck-loads. Thus the plant could be written off from profits and a lot of money spent in research and propaganda.

(2) It was easy in Germany but very difficult in England to get the physiological action of new drugs tested out.

(3) There was a high duty on pure spirit in this country even when used for industrial purposes, and this was not the case in Germany.

Other Fields of German Endeavour

Synthetic perfumes and photographic chemicals went hand in hand with the new drugs. Rayon, plastics, synthetic rubbers, synthetic fertilisers, oil from coal directly or through water gas and many other products of the highest importance and interest have followed within one generation or less.

Can you wonder that all the gases so called made by Germany in the War were made in their dyestuff plants, much of it not unlike, though naturally more modern than, those Perkin used. No wonder that the late President Wilson said that it is elementary prudence for a country to provide itself with large chemical plants. That does not arise from anything sinister but from the uncanny knowledge of how to make things from coal tar products that Perkin's discoveries brought into the world.

In August, 1914, the greater part of our textile trade, and other trades which used colour, were dependent on the great German dye companies for their supplies. Quite extraordinary efforts were made during the War to render ourselves substantially independent of German supplies, and these efforts have been successfully continued.

The German dyestuff companies have worked very hard on, and have been successful in, the search for the cure of tropical diseases, sleeping sickness and malaria, from Ehrlich's trypaflavin to Bayer 205, plasmoquin and atebrin. It is of importance for all countries owning tropical possessions to be familiar with the constitution and methods of manufacture of all products whatever their source, which are of vital importance to health in that climate. I am glad that research in quinine substitutes is now being carried on very ably in this country. I commend the political importance of this work to your notice.

If genius is an infinite capacity for taking pains, then the organic chemists in the German dyestuff factories have shown genius in making from coal or coal tar or lignite tar, in addition to the substances already mentioned, substances so diverse as petrol, methyl alcohol, Diesel and lubricating oils, shampoos and soaps and even edible fats, as though Nature herself, most versatile and economical of chemists were guiding her footsteps.

Pure research in organic chemistry is beautiful in itself. In chemical factories research is indispensable; no sales department can manage without it; research and sales are interdependent. But biochemical research affects life itself, its human value is greater than either. In this branch perhaps organic chemistry may give its greatest blessing to a tortured world. Herein we may find in the end the most enduring gift wrought for us by the great adventure of this modest, unassuming, devoted man of science.

Analysis of Paint Materials

Special Methods described at Meeting of O.C.C.A. Manchester Section

A T a members' evening held recently by the Manchester Section of the Oil and Colour Chemists' Association, a number of papers dealing with the analysis of paint materials were presented. Abstracts of the papers are given below.

The Determination of Driers in Varnishes. By M. E. D. Jarrett.

The available methods for the gravimetric estimation of lead, cobalt and manganese in varnishes are both cumbersome and lengthy and involve the ashing of at least twenty or more grams of the varnish under test. A quick and simple method for their determination was described, this being a colorimetric method involving only the ash obtained from 1½ to 2 grams of the varnish. Lead is estimated by precipitating the sulphide in a colloidal condition, the orange colour of the sol being matched against that produced from a standard lead acetate solution under identical conditions and thereby the lead content of the unknown solution computed. Cobalt is estimated in a somewhat similar manner by making use of the fact that red coloured sols of the complex it forms with α nitroso β-naphthol can be prepared. Manganese is oxidised to permanganic acid by the action of ammonium persulphate in the presence of silver ions as a catalyst. The amount present is estimated by matching the resultant pink coloration against that of a standard solution of potassium permanganate.

The Determination of Acid Values.—The first essential for the accurate determination of acid values is to obtain complete and stable solutions of the oil or varnish under test. This is effected by the use of a suitable solvent mixture and within reasonable limits, the oil : solvent ratio is not of importance except where only weak solvents are used.

The common practice is to titrate the solvent mixture immediately after heating the oil or varnish. This makes the exact location of the end point impossible in the case of boiled oils, varnishes and some stand oils. To a large extent this difficulty is obviated and a sharp end point obtained by cooling the mixture down before titration. For general use, the most serviceable solvent mixture is 1 vol. alcohol to 2 vols. of benzene.

Interference of Oil Colour

Difficulties occur in the determination arising from the interference by the colour of the oil or varnish under test and though a number of ways of mitigating this are available, the " Two Phase Method " in which the colour change in the aqueous layer is observed, is found to be the most suitable. A comparison between the acid values determined by titration and using phenolphthalein as indicator and the true acidities determined electrometrically, shows that except in the cases of simple oils, rosin and run congo gum, the latter values are generally lower than the former.

In the presence of driers, it is usually possible to obtain two acid values by the potentiometric method. In these cases, the lower value expresses the free acidity while the difference between the two denotes the acid combined with the metallic driers. This difference varies from a value equivalent to the percentage of driers when added cold to the oil, to nothing as the time and temperature of cooking is increased.

The Potentiometric Examination of Anticorrosive Pigments.—From the position and trend of the time potential curves obtained with mild steel electrodes coated with various paints on immersion in different solutions, the efficacy of the paints as anticorrosive materials can be assessed and whether the protection they afford is purely the result of their functioning as mechanical barriers or whether it depends on a chemical corrosion inhibiting power of the pigment, can be determined. If the same medium is used in every case the effect of the pigments can be compared directly. In order to avoid fortuitous conclusions, the potential measurements should be made over a period of 2 to 4 weeks. From the evidence collected, it is found that lead oxide can only offer mechanical protection while red lead, and zinc chromate afford chemical protection. Potential measurements also indicate that chemical inhibition to corrosion alone is not effective when subjected to strongly corrosive solutions (*e.g.*, sea water). In such cases mechanical protection by means of impermeable coatings is of primary importance. Nevertheless, the use of a priming paint which contains pigments capable of protecting the metal chemically would serve a useful purpose in that they would combat for a considerable time the weakened corrosive influences ultimately finding a way through the protective coatings.

Degree of Unsaturation of Drying Oils

A Method for Determining Degree of Unsaturation or Oxidation of Drying Oils. By G. Knowles, J. C. Lawson, and T. McQuillen.

The principle of permanganate oxidation of unsaturated oils and fats used by Hilditch for recognition of the unsaturated acids present and by Bertram for estimating the amount of saturated fatty acid, has been applied in measuring degree of unsaturation and oxidation. A known weight of the oil dissolved in glacial acetic acid is oxidised with excess permanganate under controlled conditions. Excess ferrous sulphate is then added, and a final titration with permanganate measures the amount of oxygen absorbed by the oil in its breakdown to shorter chain acids. Improved results are obtained by use of an emulsifying agent, and Calsolene oil HS was found to be suitable.

The result may be expressed in terms of oxygen absorption or equivalent iodine value. The method gives results of the same order as the Wij's iodine value, but is not regarded as equal to the Wij's procedure in ordinary cases. Its principal application appears to be in cases where the Wij's method is not satisfactory. Such a case is that of tung oil where the method showed equivalent iodine value 208 against a theoretical value of the order of 210 and a Wij's figure of 160. Apparently, the conjugated system in tung oil does not interfere with the breakdown by oxidation. The method also gives particularly good results with blown oils, where the Wij's value is affected by presence of peroxides in the oil.

The difference in oxygen absorption value before and after blowing provides a measure of the degree of oxidation.

Summary of Results.

	A Oxygen absorption (theoretical).	B Oxygen absorption (found)	C Equivalent iodine value (From B)	D Wij's iodine value.
Oleic acid	22.9	23.5	93	91
Crotonic acid ..	93.0	95.5	—	—
Maleic anhydride ..	98.0	99.3	—	—
Linseed oil	45.7*	45.0	180	183
Tung oil	52–55†	52.0	208	160

* Calculated from D.

† Calculated from published analysis.

Evaluation of Degree of Polymerisation. By T. McQuillen and F. N. Woodward.

Morrell's work on the acetone insoluble fraction of boiled oils suggested that if a convenient extraction apparatus could be devised, the percentage of material insoluble in acetone should give a useful indication of the degree of polymerisation of a stand oil.

A suitable apparatus consists of a test tube with a siphon tube fused into the side. The oil to be extracted is weighed into the bottom of the tube. A funnel rests in the mouth of the tube, and its lower end dips below the surface of the oil.

The extraction tube is suspended in a boiling tube containing acetone and fitted with a reflux condenser. The acetone boils, condenses and drops into the funnel. It is thus forced to percolate through the oil, and from time to time automatically siphons back into the boiling tube. Extraction is complete in about 4½ hours. The apparatus may be adapted for extraction with cold solvent.

Two years' application on stand oils shows that the device gives very consistent and reproducible results, and its compactness and simplicity render it a most useful piece of apparatus in many investigations involving solvent extraction.

Fluorescence Analysis of Pigments and Intermediates. By J. Barker and F. A. Walker.

This method of examination is already applied commercially and especially to white pigments. The purpose of this investigation was to determine the extent of its application to problems occurring to pigment manufacture in general. Many pigment spot tests are based on distinctive colour reactions. The usual tests were applied to a large number of pigments and the results observed in U.V. light instead of daylight.

In many cases, although no actual fluorescence was apparent, this method of examination is still of value since very often colour changes in U.V. light are very different from those observed in daylight. Pigments may be examined in the dry powder condition, in solvents or reagents, and also in the form of a film, *e.g.*, printing ink film, paper coatings.

It was found that amongst the yellow colours examined in powder form it was possible to select two which appeared identical in daylight but in U.V. one appeared black and the other a vivid yellow. A very useful spot test for organic pigments is based on the colour produced when the pigment is treated with strong sulphuric acid. A large number of such tests were observed in U.V. light and some remarkable results obtained. Among those of particular interest were the reactions of the Helio Fast Rubines, Alizarine Cyclamine R and certain phthalocyanines.

In view of the strong fluorescence exhibited by naphthols, it was considered that the reduction products obtained from mono azo pigment dyes might give positive and specific results. A group of pigment dyes all prepared from 2-hydroxy 3-naphthoic acid was examined in this way and by suitable manipulation a distinctive fluorescence common to all the members of the group was obtained. Attempts to identify the compound responsible were not successful, but it should be pointed out that exhaustive investigation was not possible at this stage. It appears highly probable that the fluorescing compound is a derivative of the naphthoic acid—possibly 1-amino 2-hydroxy 3-naphthoic acid.

The effect of the addition of benzoyl chloride to this reduction product was interesting in that the fluorescence gradually disappeared. This did not occur with the hydroxynaphthoic acid itself. It was found that small excesses of naphthols which are often present in commercial pigment dyes, and are sometimes deleterious, could easily be detected by extraction of the pigment with dilute caustic soda and observing the fluorescence of the filtrate in U.V. light. A range of over thirty naphthols was examined in dry form and in solution and the results tabulated.

All the samples reacted fairly vigorously and an attempt to correlate the colours produced, with constitution, met with some measure of success. A large number of coated papers, printed papers and other tinctorial tests were compared in daylight and U.V. Many instances occurred in which colours of identical mass-tone and tint in daylight gave outstanding differences in U.V. Two isomers of the barium lake of an azo dye provided a good example. Examination of such specimens in U.V. is of undoubted value in colour matching but only as a confirmatory test.

Generally speaking, the technique requires considerable experience to obtain profitable results. Experiment and observation are simple and rapid, but the inference to be

(*Continued at foot of next column.*)

Chemical Matters in Parliament

Oil Test Drilling

In the House of Commons, on November 22, Lieut-Colonel Sir Thomas Moore asked the Secretary for Mines whether he could make any statement as to the progress of experimental test drilling for oil in Scotland.

The Secretary for Mines (Captain Crookshank), replied that two deep test boreholes had recently been put down in Midlothian by separate licensees under the Petroleum (Production) Act, 1934. A small quantity of oil had been encountered at one borehole, and considerable quantities of natural gas at both of them. The gas was at present shut in at both boreholes pending the drilling of two more in the neighbourhood. In addition, exploratory work was taking place on the north side of the Firth of Forth.

Power Alcohol Duty

In the House of Commons, on November 23, Major Procter asked the Chancellor of the Exchequer whether he was aware that the Trade Navigation Returns for October, 1938, showed that 9,914,362 gallons of power methylated spirits were used in the first three quarters of 1938 free of duty; and what was the explanation, in view of the tax of 9d. per gallon imposed by the Finance Act, 1938. In reply, Sir J. Simon said that the figure quoted represented "proof gallons" and not "bulk gallons." With regard to the second part of the question, the figure was shown under the heading "spirits," and the expression "free of duty" referred to the spirit duty and did not imply that power alcohol duty was not duly paid as from May 2 last since when all spirits had paid the duty of 9d. per gallon imposed by Section 3 of the Finance Act, 1938.

Subsidy to Sugar-Beet Industry

In the House of Commons, on November 24, Mr. Barnes asked the Chancellor of the Exchequer whether he would state the total amount paid out in subsidy to the British sugar-beet industry since 1924, together with the total amount of revenue lost to the Exchequer through the remission of excise duty.

Sir J. Simon replied that the total of the subsidy for the financial years 1924-25 to 1937-38 was £40,958,834. Excise duty was levied on sugar manufactured in this country from home-grown beet, and by remission of excise duty he took the hon. member to mean the difference between the amount of duty payable and the amount which would have been received had duty been charged on a similar quantity of British refined sugar of foreign origin. This difference amounted for the same period of 14 years to £19,532,000.

THE GLASS INDUSTRY IN INDIA

The technical and economic conditions of the glass industry in the United Provinces, India, are being studied by Dr. Alexander Nadel, who was appointed Glass Technologist to the U.P. Government in September last. He is expected to submit his preliminary report to the Government shortly. According to Dr. Nadel, the industry has a bright future in the country in spite of the fact that the purchasing power of the people is low. He is of the opinion that articles of good manufacture have a ready market everywhere and India is no exception to the rule. What is required in India is an increase in technical efficiency and a change in the mentality of the manufacturers who go in for the production of very cheap material.

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drawn is frequently far from obvious. It was found difficult to form general conclusions in many cases and it is then necessary to refer to control samples of known composition, and to use the U.V. test in conjunction with information given by other methods of examination.

Secret Process Dispute

Appeal of British Industrial Plastics, Ltd., Dismissed

THE Court of Appeal, last week, dismissed an appeal by British Industrial Plastics, Ltd. (formerly British Cyanides Co., Ltd.), who manufacture resins and moulding powders, of Ideal House, Argyle Street, W., from part of the judgment of Mr. Justice Porter (now Lord Porter) in an action (see THE CHEMICAL AGE, 1938, January 29, p. 84; February 19, p. 144), in which the company claimed damages for alleged conspiracy from Mr. John Edward Ferguson, of Sutherland House, Marloes Road, W., James Ferguson and Sons, of Lea Park Works, Prince George's Road, Merton Abbey, S.W., and Mr. Stephen Walter Doherty, a former works manager of the plaintiffs.

Patent for Manufacture of Amino Plastic Powders

It was alleged that Mr. Doherty entered the employment of James Ferguson and Sons, Ltd., and assigned to that company his right to a patent for the manufacture of amino plastic powders which British Industrial Plastics, Ltd., claimed was their secret process. Plaintiffs also sought an injunction against the defendants to restrain them from disclosing or making use of plaintiff's secret process and further claimed against Mr. Doherty for breach of contract and against Mr. Ferguson and Messrs. Ferguson for inducing the alleged breach. All the allegations were denied by the defendants.

Mr. Justice Porter awarded £15,000 damages against Mr. Doherty (who left the employment of Messrs. Ferguson in 1936) and gave judgment for Mr. Ferguson and James Ferguson and Sons, Ltd., with costs. It was against the latter part of the judgment that the plaintiffs appealed.

In giving judgment Lord Justice Slesser said that it was not disputed on behalf of the defendant company and Mr. Ferguson that Mr. Justice Porter was right in holding that Mr. Doherty (who did not appeal) did break his contract with the plaintiffs, but it was also contended that the Judge was right in coming to the conclusion that the plaintiff company had failed to prove that the defendant company and Mr. Ferguson had induced Mr. Doherty to break his contract so as to give the plaintiffs a right of action against them in Court. To establish such a cause of action it was necessary, in the first instance, for the plaintiffs to show that the act complained of was wilfully and knowingly done. It had been found in this case by the Judge that the defendant company and Mr. Ferguson suspected that Mr. Doherty's knowledge of the process was, at any rate in the main, derived from his experience at the plaintiffs' works and that his process might be the plaintiffs' or some part of it, and secret. If the view of the Judge be accepted, as he (the Lord Justice) accepted it, that, before the respondents received the information of the process, they referred Mr. Doherty to their patent agents for advice whether the process was or was not secret, albeit the method they chose to arrive at that conclusion was totally inadequate, yet if it were *bona fide* it did not seem that it could be said that they acted wilfully and knowingly, either in the sense that they acted with actual knowledge that Mr. Doherty would break a contract, or in the sense that they refused themselves the means of knowledge by wilfully shutting their eyes.

No Evidence of Conspiracy

Referring to the contention on behalf of the plaintiffs that in so far as the defendants did in fact procure Mr. Doherty to destroy the secrecy of the plaintiffs' process by telling him to publish the secret matter to the patent agents, they had illegally induced a breach of contract, Lord Justice Slesser declared that on the finding of the Judge, the respondents thought that if the patent agents certified that Mr. Doherty had a patentable method they could safely use it and employ him. They were without a fraudulent mind. In those cir-

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cumstances, even if the publication of the secret to their patent agents by Mr. Doherty was procured by them (the respondents) they had a lawful excuse or justification for asking him to take steps which, if proper ones, would have protected both the plaintiff company and themselves from any risk of misuse by themselves or Mr. Doherty. Considering all the circumstances of the case, he (Lord Justice Slesser) thought that the case was one where it should be held that there was justification in the desire of the defendants not to break the law. The plaintiff company failed and the question of actionable damage did not arise.

It was said that the Judge was wrong in refusing to find conspiracy between Mr. Doherty and the defendant company. That seemed to him (Lord Justice Slesser) to be entirely a question of fact, and he could not find in the evidence any reason to come to the conclusion that there was here any combination of the various defendants wilfully to injure the plaintiffs by unlawfully becoming possessed of their secret and confidential information and thereby to deprive them of its exclusive use and to obtain the benefit thereof themselves so as to compete with the plaintiffs and to secure patent protection. The Judge was right in finding that the respondents did not act wilfully with that intent against the plaintiffs and that there was no evidence of a wilful combination between them and Mr. Doherty. The appeal failed and must be dismissed, with costs.

Leave to appeal to the House of Lords was granted.

Iodine Number Determination

A Modified Technique

A NEW method of determining the iodine number of a fat, which combines some of the characteristics of Hübl's method with others of Wij's method, has been developed by Dr. Giuseppe Scotti, of Florence. Instead of using an alcoholic solution of iodine, Dr. Scotti advocates the use of a benzol solution as this solvent has the advantage of making the elimination of alcohol and chloroform unnecessary, and of simplifying the reaction of the iodine with the unsaturated fatty acids, which, in Hübl's method, is extremely complicated. Iodine, moreover, has no action on benzol in cold solution and the solution is rapidly and easily prepared, remaining unchanged after long storage. He also suggests the use of mercuric acetate instead of mercuric chloride as catalyst, the acetate being dissolved in 98 per cent. acetic acid to make a solution of 10 per cent. concentration. The acetate, he finds, attaches itself to unsaturated bonds more readily than the chloride.

The reaction, according to Scotti's method, is first to block both positions of the double bond in unstable fashion with mercuric acetate. Two molecules of acetate are needed for each double bond, and addition of iodine replaces the mercuric acetate, four atoms of iodine being required for each double bond. One of these four atoms fixes itself to the bond immediately, the two succeeding ones fix the two atoms of mercury, previously fixed to the bond, and the fourth atom of iodine then attaches itself to the bond.

N.P.L. NEW FEES SCHEDULE FOR VOLUMETRIC GLASSWARE TESTS

A new schedule of fees for tests on volumetric glassware at the National Physical Laboratory came into operation on December 1. On the old schedule fees a discount of 33⅓ per cent. was allowed on batches of twelve or more vessels of the same type and capacity. The new fees are on a nett basis, and, generally speaking, are equal to less than the old fees, less the 33⅓ per cent. discount previously only obtainable on batches of one dozen or more vessels of the same type and capacity sent together for test. In addition the new schedule covers a considerably larger range of apparatus.

The Homogeneity of Glass—Detergency and the Glass Container

Discussed at Meeting of Society of Glass Technology

AT a recent meeting of the Society of Glass Technology held in St. Helens, under the chairmanship of the President, Dr. C. J. Peddle, two papers were presented, the first being "The Homogeneity of Glass," by F. J. Hurlbut, M.A., of the United Glass Bottle Manufacturers, Ltd. Mr. Hurlbut said that for nearly every industry a machine could be found on the market which would carry out the mixing process efficiently. In the case of the glass industry, apart from the general use of the drum type of mixer, there was little that could be done with regard to the homogenising of the glass. The manufacture of optical glass formed an exception, where the application of automatic stirring devices ensured a more perfect homogenising of the melt.

With regard to glass melted in tank furnaces, the specific properties of the glass which influenced the homogeneity were:—the viscosity, the surface tension and the molecular diffusion. In considering a tank furnace containing colourless glass, with a surface temperature of 1,450° C., and a glass depth of 40 inches, the temperature at the bottom was about 1,250° C. Corresponding to these temperatures, the viscosity of the glass was respectively 200 and 800 poises. Thus the circulation of the glass under the influence of temperature differences must be very slow, especially at any great depth below the surface. The downward current in the vicinity of the tank walls was probably 0.1 metre per hour. This very slow motion indicated that the mixing action due to temperature differences was very small.

Surface Tension Effect

The property of surface tension exerted an important effect on the homogeneity of the melt. The glass which was freshly melted would contain numerous cords differing in composition from the main body of the glass. In those cases where the cords possessed a surface tension less than that of the surrounding glass, they would be easily dispersed into the melt. On the other hand, if they possessed a greater surface tension, the tendency would be to adopt a spherical form in opposition to the glass movements.

The third factor to be considered was the molecular diffusion of glass. In the case of silicate melts this effect could be neglected as the velocity of diffusion was extremely small. For the completion of homogenising in tanks, they were dependent largely on sluggish thermal currents.

The mixing effect of the gas bubbles given off by reactions during the melting process was important. This effect could be helped by the proper choice of grain size. Contamination from the refractory materials of the tank construction was also a source of trouble. Another source of contamination arose from the accumulation of glass of a different composition from that of the main body of glass on the bottom of the tank. This effect was naturally dependent on the depth of the tank. Surface volatilisation of alkali, too, had an effect on the homogeneity of the glass. In the production of fluoride opals, the unavoidable loss of a gaseous constituent altered the properties of the surface layer, forming a glass of higher density and viscosity than the main body of the glass. This layer drained to the bottom of the tank, accumulating alumina in its passage, to form a stable layer.

Finally, the author pointed out that the most careful attention to all the above points was without effect if the glass delivered to the machines was not chemically homogeneous.

* * * *

The second paper entitled "Detergency and the Glass Container," by E. O. Rounsefell, B.A., B.Sc., of I.C.I. (Alkali), Ltd., dealt with processes which bottlers adopted for cleaning their returnable glass containers and fitting them for further charges of their ware. These processes involved the use of alkaline detergents in a machine of some kind.

He said that a modern glass container detergent must be capable of washing and cleaning satisfactorily a wide variety of containers. It was not only necessary that the residues in all these bottles should be washed away and the glass left clean and sparkling, but that bacteria yeasts and moulds be killed so that there was no possibility of infection remaining in the washed bottles.

The ideal detergent solution must be suitable for use in a wide variety of washing machines. These might be summarised briefly into four classes: (1) the hand soaker; (2) the hydro machine; (3) the hydro-soaker; (4) the hydro-soaker with automatic brushes. Whatever type of machine was used, trouble was always experienced if the water supply was hard. The addition of sodium carbonate to hard water precipitated calcium carbonate which formed a tenacious film on the bottles. It also formed scale on the various machine parts, and choked the pipe lines and jets.

These difficulties were particularly marked in the days when caustic soda alone was used as a detergent, especially as the latter was a poor rinser. Caustic soda, however, apart from these faults approached most nearly to the ideal detergent. It was a powerful cleanser, it converted fatty matter into soaps whereby its emulsifying powers are increased; finally, it was an excellent bactericide and steriliser. It was natural, therefore, that caustic soda should have been made the basis of all detergent solutions, and that manufacturers should have endeavoured in various ways to overcome its poor rinsing and scale forming properties. These properties had been modified, if not completely neutralised, by the addition to the caustic soda of other alkaline compounds such as sodium carbonate, sodium silicate, trisodium phosphate or sodium hexametaphosphate. Borax and starch had also been used occasionally. With the exception of sodium hexametaphosphate, all other additions to a detergent solution would not prevent scale formation with a hard water supply.

HOLIDAYS WITH PAY

A conference on workers' holidays was held under the auspices of the Industrial Welfare Society at the Park Lane Hotel, London, on Wednesday. Lord Amulree, chairman of the Committee on Holidays with Pay, who presided, said that four million workers in this country already had paid holidays by voluntary arrangement, and the movement was spreading. His committee had therefore recommended a further period for experiment before legislation was introduced, so that when the appropriate time came there should be ample data on which to frame regulations.

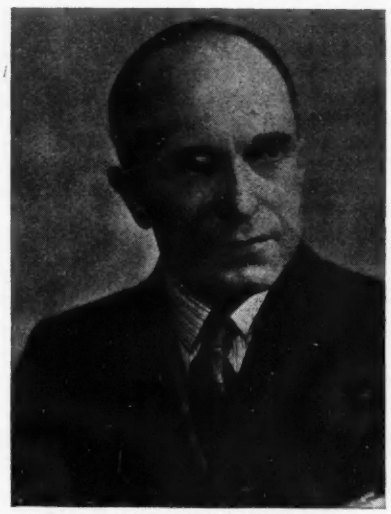
Mr. Robert Hyde, director of the Industrial Welfare Society, said that there was no early likelihood of a general advance in wages sufficient to enable all workers to take a holiday under present conditions. The problem was primarily one of finance. Many of the working class could not afford a family holiday, which involved not only accommodation and travelling expenses, but the cost of maintaining their home in their absence. Mr. Hyde warmly commended the National Savings Scheme, and also referred to the excellent schemes now operated by many firms. In this connection it was advisable to establish trust funds in order to safeguard the contributions and to gain the workers' confidence. "There are many problems to be solved," Mr. Hyde concluded, "but firms which have introduced the 'five-day week' have overcome their early difficulties, and no doubt holidays with pay will eventually be attained on a satisfactory basis."

British Association of Chemists

Proceedings of the 21st Annual General Meeting and Banquet

THE 21st annual general meeting of the British Association of Chemists was held at the Waldorf Hotel, London, on the afternoon of November 26, the chair being taken by Dr. J. Vargas Eyre, president of the Association

The honorary treasurer, MR. W. H. WOODCOCK, in presenting his report, said that reference to the balance sheet would show that there had been a substantial increase in subscription revenue during the past year. On the other side, while most expenses remained at about the same figures as the previous year, there had been increases in staff salaries and propaganda expenses. In the final result, there was a small deficit on the year's working. The resources of the unemployment benefit fund had increased and it had been possible to put by a considerable sum to reserve. Both the legal aid fund and the special aid fund were in a good position. Mr. A. Churchman, in proposing the adoption of the report and the balance sheet as presented, said that it was a very satisfactory report and paid a tribute to the valuable work of the honorary treasurer.



J. Vargas Eyre, M.A., Ph.D., F.I.C., President of the British Association of Chemists.

Report of Council

Presenting the annual report of the Council, MR. A. J. C. COSBIE said that he would like, first of all, to draw attention to the fact that Dr. Eyre had agreed to continue in the office of President for a further year. The Association was to be congratulated on securing for a further period the services of such an energetic President who took a keen interest in its activities.

The total membership of the B.A.C. was now 1,914, 138 new members having been elected during the year; there was a net increase of 40 members. Stating that this position was fairly satisfactory, Mr. Cosbie said that he used the word "fairly" advisedly because he thought that the Association ought to have many more members. He made a plea for increasing the membership; the Association's unemployment insurance scheme was unique and should prove to be a great attraction to chemists. He was sorry to see that only a very modest sum had been donated to the legal aid fund during the past year. He thought that it was a very great pity that the donations to the fund had fallen, he thought it was due to the fact that the real value of the fund was only appreciated when the individual member was faced with an issue that required special support.

The unemployment fund was one of the main planks of the B.A.C. platform and it was essential that it should be supported. He was glad to say that the fund was going from strength to strength. The appointments service had experienced a very busy year and its work was one of the most spectacular achievements of the Association. As regards legal aid, it had not been necessary to take any case into court during the past year, all claims being settled by negotiation mainly because the Association had been able to establish a principle. It had again been suggested that the *Chemical Practitioner* might occasionally include a technical article; Mr. Cosbie said in his personal opinion the journal should be limited purely to matters connected with the Association's activities.

MR. J. B. P. HARRISON, chairman of the Unemployment Special Purposes Committee, then presented that committee's report. The committee had drawn up a scheme whereby increased benefits might be paid to members of long standing and an arrangement had also been drawn up for the administration of the National Insurance Act, in conjunction with the Association's present unemployment benefit fund. It was also proposed that the Association should administer National Insurance on behalf of probationers and students who had not hitherto been eligible for participation in the unemployment benefit fund. After discussion, a proposition of Dr. Eyre, seconded by Mr. Harrison, that the amendments to the rules and the new rules drafted in connection with the committee's recommendations be approved and submitted to postal ballot, was carried. A proposal to amend the rules to cover the issuance of a certificate of membership of the Association was carried unanimously. The officers for the ensuing year were then elected as follows:—President, J. Vargas Eyre, M.A., Ph.D., F.I.C.; vice-presidents, J. Bristowe P. Harrison, F.I.C., Professor I. M. Heilbron, D.S.O., F.R.S., Professor A. G. Green, M.Sc., F.I.C., F.R.S., Sir James Colquhoun Irvine, C.B.E., F.R.S., Paul Haas, D.Sc., and W. H. Woodcock; hon. registrar, Professor E. C. C. Baly, C.B.E., F.I.C., F.R.S.; hon. treasurer, W. H. Woodcock; hon. editors, H. T. F. Rhodes, M.I.E.I., and J. P. Lawrie. In conclusion, a hearty vote of thanks to the officers of the past year, proposed by Mr. H. Langwell and seconded by Mr. F. Page Evans, was carried with enthusiasm. Dr. Eyre, in a brief reply, paid tribute to the work of Mr. C. B. Woodley, the general secretary, and his staff.

21st Anniversary Banquet

In the evening the Association held its 21st anniversary banquet at the Waldorf Hotel, Dr. J. Vargas Eyre, the president, occupying the chair. The toast of the "21st Anniversary of the British Association of Chemists" was proposed by PROFESSOR F. G. DONNAN, president of the Chemical Society, who said that he regarded the Association as an excellent professional body. People had said to him, "Oh, they are a trades union," but his reply to that was that he was proud to regard himself as a member of the chemical advisory committee of the Trades Union Council. When the Association registered as a trades union it did a great thing of which they had nothing to be ashamed. He thought it was a good thing that chemists should be able to fight and secure representation; they were normally much too mild and modest. After paying tribute to the facilities available for members of the Association, Professor Donnan referred to efforts to unite all chemists in this country. He stated that chemists were very difficult people to combine but if the endeavours of the British Association of Chemists in this direction were successful it would be a great achievement.

Responding, DR. J. VARGAS EYRE said that the Association was born to surmount difficulties and grievances and it had been singularly successful. In 1921 the membership of the Association was 800, in 1930 1,200, in 1934 1,600, and this year it was 2,000. They were celebrating their 21st anniversary in times of crisis and anxiety. He did not know what had been learned in the past 21 years, but judging by recent happenings one would think that the part played by chemists in the past had been almost forgotten. He suggested that

there should be drawn up a register of young men who had works experience so that in case of emergency they would not drift away into services for which they were not so well apprenticed. He thought the various chemical societies should co-operate on that point.

DR. E. F. ARMSTRONG also responded and stressed the importance of chemists realising their obligations. The members of the B.A.C., he declared, had realised those obligations and fulfilled them, but there were from 5,000 to 10,000 other members of the profession who were not pulling their weight. Across the Atlantic, chemists had an association with a membership of 21,000, and in this country they ought to have at least 10,000 members. Until chemists realised their obligations chemistry as a profession would not occupy the position it ought to occupy, and the freedom they had as chemists was being abused.

In a humorous speech, Dr. Herbert Levinstein, past-president of the Association, proposed the toast of "Chemistry and Industry," to which Dr. L. H. Lampitt, representing the president of the Society of Chemical Industry, responded.

The toast of "Our Guests" was proposed by Mr. S. Reginald Price, past-president of the B.A.C, Dr. W. Cullen, president of the Institution of Chemical Engineers, responding.

Among those present were:—Lt.-Col. and Mrs. S. J. M. Auld, Mr. and Mrs. W. A. Damon, Dr. and Mrs. J. J. Fox, Mr. A. J. Gibson, Mr. T. E. Grant, Dr. and Mrs. L. A. Jordan, Mr. and Mrs. W. Lloyd Willey, Dr. and Mrs. Ainsworth Mitchell, Sir Gilbert and Lady Morgan, Mr. and Mrs. C. Rhodes, Professor W. H. Roberts, and Dr. A. J. V. Underwood.

DISCHARGE OF CRUDE SEWAGE INTO MERSEY ESTUARY

DR. B. A. SOUTHGATE, Ph.D., D.Sc., of the Department of Scientific and Industrial Research, read a paper on the discharge of crude sewage into the estuary of the River Mersey, at a joint meeting, held recently at Liverpool University, of members of the Liverpool and North-West Section of the Institute of Chemistry, and the Liverpool Section of the Society of Chemical Industry. Dr. Southgate explained that for many years there had been controversy amongst the Merseyside interests concerned as to the possible effects of the discharge of large volumes of untreated sewage on the deposition of solid matter in the estuary of the River Mersey. Some five years ago the Department of Scientific and Industrial Research undertook an investigation of this problem. Numbers of experiments were described, relating to the sedimentation of mud in different depths of sea water, with and without sewage, and with the water in motion and in a manner similar to tidal flow. Samples of mud taken locally and from other rivers were compared and considered as regards their relative contamination with sewage. It was concluded that the crude sewage discharged into the estuary of the River Mersey had no appreciable effect on the amount of hardness of the deposits in the estuary.

Mr. B. D. W. Luff, who presided, tendered the congratulations of the Section to Mr. J. J. Nance, who had been elected Mayor of Bebington. He succeeded Lord Leverhulme, who was the Charter Mayor of the Borough.

DIAMOND JUBILEE OF THOS. W. WARD, LTD.

To commemorate the 60th anniversary of the founding of the firm, Thos. W. Ward, Ltd., Sheffield, have issued a magnificently produced Diamond Jubilee book. Comprising 76 pages, the book gives details of the directorate of the company and its associate companies, a summary of the 60 years' history of the firm, and illustrations of the past and present offices and works. In the main, however, its pages are devoted to descriptions of the extensive operations of the company in works dismantling, shipbreaking, scrap, machinery, etc. Each section is profusely illustrated.

Recent Trade Literature

Gutta percha vessels, which are mainly made for holding hydrofluoric acid, are the products of SHEATH BROTHERS, whose latest catalogue lists a variety of these vessels. Although gutta percha vessels are valuable for holding hydrofluoric acid because of the non-resistance of glass vessels to the latter, the material will also withstand the action of dilute sulphuric and several other acids.

ASHWORTH AND PARKER, LTD., who have recently issued a pamphlet describing the Parker pass-out steam engine, explain that pass-out working has been used with steam turbines for a great many years, and is associated by many people exclusively with turbines. Just as, however, a quite small reciprocating steam engine is more economical on back pressure working than any size of turbine, so the pass-out steam engine is more economical than the pass-out steam turbine, unless the steam extracted is only a small proportion of the total.

The Escher Wyss News, No. 3, 1938, published by the ESCHER WYSS ENGINEERING WORKS, LTD., contains articles on "Steam consumption measurements on recently installed steam turbine plants," by R. W. Peter; "The Rectaflux condensing steam turbine," by J. J. Spoerry; and "Families of curves for determining stresses in rotating discs by means of conical rings according to the method of Keller," by Dr. F. Salzmann. Mr. Spoerry explains in his article that Escher Wyss have developed the Rectaflux type of turbine to avoid costly foundations and particularly the provision of a basement for the condensing plant.

A new type of strainer for fluids, the Rotoklene self-cleaning oil strainer, has been introduced by ASHWORTH AND PARKER, LTD., who have issued a leaflet describing the appliance. The Rotoklene is suitable for straining oil, water, soap, and practically all liquids either hot or cold. It is of simple design with few parts; there are so substantial that they are not liable to failure from corrosion or weakness. It is strongly constructed and can be operated continuously by belt or motor drive where constant cleaning is necessary. The new winding with wire is said to be immensely strong, offers a minimum resistance to flow, and does not become choked. Straining down to 1/2,000 in. can be obtained without diminution of strength.

Rotary dryers and other plant manufactured by PRATCHITT BROS., LTD., are described in a catalogue issued by the company. Various types of appliances are illustrated, and in dealing with a rotary dryer, it is stated that the output is determined by moisture content before and after drying, though both the physical and chemical nature do in some cases affect the output to a large extent. Working on products averaging from 15 per cent.-10 per cent. moisture, it is found on entering the dryer that the evaporative capacity of the unit ranges from 4 lb. to 8 lb. of moisture per hour per cu. ft. of cylinder volume, and fuel consumption, based on coal at 13,000 B.T.U. (or its equivalent in coke, oil or gas) ranges from 5 lb. to 8 lb. of moisture removed per lb. of coal.

The removal of organic sulphur from gas by the "Holmes" and Gas Light and Coke Co. processes is described in a leaflet produced by W. C. HOLMES AND CO., LTD. Illustrations are given of some typical plant installed by Holmes and Co., including the oil washing plant at the Kensal Green works of The Gas Light and Coke Co., London, which is the largest installation at present in operation, and treats eight to nine million cu. ft. of gas daily, recovering 90 per cent. of the benzole and removing 80 per cent. of the organic sulphur content. The company have also issued a pamphlet dealing with plant for raising unscreened sewage and other semi-fluids by the Holmes-Bentley low-pressure unit system. A sectional drawing of a Holmes-Bentley ejector shows the entire absence of air inlet, exhaust or alternating valves. The ejectors are operated by a direct coupled motor-driven reversing compressor, which secures perfect alternating without complication.

Personal Notes

SIR ROBERT HADFIELD, F.R.S., chairman of Hadfields, Ltd., celebrated his eightieth birthday on Monday.

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MR. K. B. HUTTON, of New College, has been awarded the Gibbs Scholarship in Chemistry, 1938, at Oxford University.

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MR. PATRICK HENRY KIRKALDY, late hon. treasurer of the Institute of Chemistry, left estate valued at £15,568 (net personalty £14,797).

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MR. HENRY JOHNSON, a director, and until two years ago managing director, of Courtaulds, Ltd., has left estate valued at £554,380 (net personalty £456,960).

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MR. ALBERT LESLIE WRIGHT, managing director of the Butterley Co., Ltd., and chairman of the Riddings District Gas Co., has left estate valued £175,057 (net personality £170,509).

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MR. WILLIAM ROBB BARCLAY, managing director of Henry Wiggin and Co., Ltd., and consulting metallurgist to the Mond Nickel Co., left estate valued at £23,452 (net personalty £19,680).

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MR. C. B. DAVIES, of Trinity Hall, has been awarded the studentship offered to Cambridge University by the Dyestuffs Group of Imperial Chemical Industries, Ltd., for research on any particular problem that requires investigation.

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MR. JAMES HAMILTON, a director of Pinchin, Johnson and Co., Ltd., paint manufacturers, and for many years vice-chairman of the Anglo-American Oil Co., has left estate valued at £338,642 (net personalty £328,434).

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PROFESSOR NIELS HENRIK BOHR, director of the Copenhagen Institute of Theoretical Physics, was presented on Wednesday afternoon with the Copley Medal, the Royal Society's principal annual award, for his outstanding research work during the year.

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DR. IRVING LANGMUIR, associate director of the Research Laboratory of the General Electric Co., Schenectady, New York, and winner of the Nobel Prize for Chemistry in 1932, arrived in London on Wednesday to attend the annual dinner of the Royal Society that evening. On December 10 the honorary degree of Doctor of Science will be conferred on him at Oxford University.

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DR. C. A. DESCH, PROFESSOR A. C. G. EGERTON, AND PROFESSOR J. C. PHILIP have been appointed members of a committee constituted by the British Association to work the Division for the Social and International Relations of Science, which was established at the recent meeting of the Association at Cambridge. The main purposes of the Division are "the objective study of the effects of advances in science on communities, and reciprocally the effects of social conditions upon the progress of science; and the encouragement of the application of science to promote the well-being of Society."

OBITUARY

DR. FRANCIS WOODCOCK GOODBODY, lecturer in medical chemistry at University College, London, since 1919, has died at the age of 68.

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MAJOR ISAAC WANNOP LAMONBY, D.S.O., chairman and managing director of the Grassmoor Co., Ltd., and a director of the National Benzole Co., has died at the age of 52.

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SIR ALFRED STEPHENS, J.P., a director of Stephens Silica Brick Co., Ltd., the Bynea Steel Works, Ltd., the Gorse Galvanising Co., Ltd., and St. David's Tinplate Co., Ltd., died on Monday at the age of 67.

(Continued at foot of next column.)

Foreign Chemical Notes

Belgium

ERECTION OF AN ALUMINIUM WORKS is planned by the Metallurgie de l'Escaût in association with the Société d'Aluminium Français.

Poland

SYNTHETIC RUBBER now in production at the new factory at Dembica will be used in motor tyres to be manufactured in a neighbouring factory by the Stomil Company, of Posen.

FOUR NEW ALCOHOL DISTILLERIES will shortly commence production for the purpose of meeting the demand for alcohol from the new synthetic rubber factory.

Sweden

TO DEVELOP THE MANUFACTURE in Sweden of a new explosive discovered by Engineer K. W. Nielsen, of Copenhagen, a company has been formed in Angelholm with a minimum capital of 50,000 kroner.

ANTI-GAS PROTECTIVE CLOTHING is being produced from "Alofan," a sheet material of the viscose type manufactured by the A.B. Nordisk Silkecellulosa, of Norrköping. Adequate protection from gas is secured by sandwiching a layer of fishnet fabric between two layers of Alofan.

Italy

A HIGH DEGREE OF GERMICIDAL EFFICIENCY on the part of sodium metasilicate has come to light in an investigation carried out at the Milan University Institute of Hygiene. At ordinary temperatures, a 1 per cent. aqueous solution kills cholera and typhoid organisms in less than a minute, while a 3 per cent. solution kills coli bacilli in 2½ minutes. At 60° C. some of the most resistent pathogenic organisms are destroyed in less than a minute. Lactic acid bacilli are destroyed at 20° C. by a 2 per cent. solution in a minute. In general, the experiments confirm the efficiency of sodium metasilicate as a sterilising detergent in the laundry and food industries.

WORKS FOR PRODUCTION OF NEW TYPE RED LEAD

Ericssons Telephones, Ltd., who have acquired the British Empire rights to manufacture and market red lead produced under a new process invented by Dr. R. Maier, of Marktredwitz, Germany, have erected a plant at the Ericsson Works, Beeston, Notts, which is said to be the largest red lead plant in the world. The erection was supervised by Dr. Maier and production is expected to begin shortly. The project is being handled through a recently formed subsidiary company, Micro-Lead Products (Ericsson), Ltd.

The process consists of direct vaporisation of pure lead in an electric arc furnace and passing the lead vapour into a precipitating chamber where it mixes with pure oxygen, and by controlling temperature, pressure and feeds, produces the new type red lead. Higher corrosion resisting properties and almost twice the covering qualities of standard red lead, are claimed for the new product. Mr. A. Brookes, of Ericsson Telephone, Ltd., described the new process and plant to a recent meeting of the Nottingham Society of Engineers. (See THE CHEMICAL AGE, May 21, 1938, pages 402-3 for a description of the product).

(Continued from preceding column.)

MR. JOHN HARTLEY BIBBY, who managed the Garston copper rolling works and the St. Helens smelting works of his family's business of John Bibby, Sons and Co. for many years, has died at the age of 74. When the Broughton Copper Co. acquired the Garston works he was appointed a director and remained on the board until two or three years ago, when the concern was absorbed by Imperial Chemical Industries, Ltd.

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General News—From Week to Week

BIOCHIMIE, LTD., chemical manufacturers, etc., 11 New Court, Lincoln's Inn, W.C.2, changed their name to Suffarsenol Laboratories, Ltd., on November 5.

AN AMERICAN POTASH EXPORT ASSOCIATION has been organised under the Export Trade Act by the leading potash manufacturers, including the American Potash and Chemical Corporation, the United States Potash Co., and the Potash Co. of America.

NO. 1 BLAST-FURNACE AT THE RENISHAW IRON WORKS, Derbyshire, is to be damped down because production of pig-iron is in excess of demand. Between 60 and 70 men will be temporarily out of work. The furnace was relit in the middle of July after being shut down from the end of May.

SWEDEN'S FOREIGN TRADE DURING THE MONTH OF OCTOBER resulted in a rise of imports of 6,500,000 kronor to 198,900,000 kr. (£10,025,000), compared with the corresponding month last year, while exports fell by 34,700,000 kr. to 160,600,000 kr. (£8,278,000). Imports of chemical products, textile goods, and machinery showed the heaviest increase.

ACCORDING TO STATUTORY RULE AND ORDER, No. 1389, of 1938, bearing Monday's date, the following organic intermediate products have been exempted from section I of the Import Duties Act, 1932: Fast Dark Blue Salt R, Rapidogen Black I T, Rapidogen Bordeaux R N, Rapidogen Golden Yellow I F G and Rapidogen Yellow I 4 G.

THE SEVENTY-EIGHTH ANNUAL DINNER on November 26, of the sports association of Howards and Sons, Ltd., chemical manufacturers, of Ilford, was attended by Mr. George Hireson, a pensioner of the firm, who has been present at every one of the dinners from 1860 onwards and can recall conversations with Luke Howard, who founded the firm in 1797.

BARR AND STROUD, LTD., scientific instrument manufacturers, are to undertake the construction of an air-raid shelter for their workers and staff at their works at Anniesland, Glasgow, at an estimated cost of £25,000. The scheme is the first to be incorporated in any public works in Scotland. It will provide accommodation for between 2,000 and 3,000 people.

FIRE BROKE OUT AT THE NATIONAL OIL REFINERY at Llandarcy, near Swansea, on Tuesday morning. Considerable danger was threatened by sparks blowing toward the huge storage tanks, but despite much difficulty from burning kerosene fumes the firemen were able to confine the flames to the pumphouse. Another pumphouse has been brought into commission, and oil transmission from the Swansea Docks to the refinery will not be affected.

CANADIAN MINERAL PRODUCTION in the fifteen years from 1922 to 1937 has totalled $4,102,006,204, an average of $273,467,280 annually for the period. The total represents $3,725 per capita of Canadian population. Production in 1937 was $457,359,092 and this represented a gain of 26.4 per cent. over 1936, when the total was $361,919,372. In the first half of 1938 the estimate made by the Dominion Bureau of Statistics is $209,654,610, as compared with $215,382,814 in the corresponding half of 1937. There have been gains in the volume production of lead, copper, zinc, gold, silver and declines in nickel, asbestos, chromite and a number of non-metallics. The volume gains in the principal metallics have been offset by declines in market prices.

AT A RECENT MEETING OF THE ADVISORY COMMITTEE representative of the hosiery manufacturers, dyers, wholesale and retail distributors and stores, arranged by the British Colour Council at the request of the Hosiery Dyers and Finishers' Association, Ltd., a selection was made of the shades to be issued on a standard card. The shades selected are based on advance information secured by the British Colour Council, one of whose main objects is to place colour determination in British hands, and are intended primarily for the medium or cheaper grades of silk and rayon hosiery. It was generally felt that a reduction in the number of shades would be in the interests of all sections of the industry. The standard card was issued this week.

THE CONVERSION OF WASTE MATERIAL which may be somewhat of a nuisance into a marketable mineral product is the object of a study being conducted by the Bureau of Mines, U.S. Department of the Interior, designed to recover sulphur from smelter smoke. One of the methods for extracting the sulphur, which may be recovered as marketable elemental sulphur or as liquid or solid sulphur dioxide, is to use some suitable solution to absorb the sulphur dioxide. The results of some experiments made on three of the most promising amines as absorbents are now available in Report of Investigations 3415, of the Bureau of Mines. The capacities of these and other absorbing solutions are compared, but several factors, found only by large-scale tests, enter into the choice of a suitable absorbent. A supplement to this report reviews the principal articles recently published in the technical press on sulphur dioxide recovery, as well as several patents.

A CLAIM FOR 10s. A WEEK ADVANCE for all employees of Imperial Chemical Industries, Ltd., throughout the country in the engineering group was made by members of the Amalgamated Engineering Union and other craft unions at a meeting with I.C.I. representatives in London last week.

THE DUCHESS OF GLOUCESTER has promised to be present at the dinner-ball organised by the British Women's Hospitality Committee to welcome overseas buyers to the British Industries Fair. The function will be held at Grosvenor House on March 1, when Mrs. Neville Chamberlain will be hostess.

BOB MARTIN, LTD., manufacturers of dog medicines, etc., of Southport, have just opened new laboratories and offices with a total floor area of 19,000 square feet. It is interesting to note that the Bob Martin Laboratory Service Bureau each year answers between 25,000 and 30,000 queries submitted by customers.

REMARKING THAT THE EXISTING STATE OF AFFAIRS was handicapping teaching and research, Lord Derby, Chancellor of Liverpool University, stated at the annual meeting of the University Court on November 25 that there was no alternative but to start construction of a new building for organic chemistry. It would cost £106,000, towards which a number of chemical firms and companies had contributed £20,000.

MR. W. A. S. CALDER, at the dinner-dance of the Yorkshire Section of the Society of Chemical Industry and the Institute of Chemistry (Leeds Area Section) on Wednesday, emphasised the need for a "Federation" of Chemists which could really talk to the world and talk to the Government on behalf of members of the profession. He said that in the past no practical scheme for the formation of such a body had been put forward, but he felt certain that it would come.

THE PRODUCTION OF CHEMICALS IN URUGUAY is carried on both by the State and by private enterprise according to the American Consulate General at Montevideo, but in spite of the fact that a large variety of chemicals are made, the facilities for production are insufficient to supply the local demand as respects quantity for any particular one, except possibly sulphuric acid, and local industry is still dependent upon foreign sources of supply. Imports of chemicals and allied products in 1936 (the latest year for which figures are available) were valued at $1,400,000, of which amount Germany supplied 26.5 per cent., United States 24.8, and the United Kingdom 16.

TO MEET THE DEMAND FOR GENERAL INFORMATION ON AIR CONDITIONING, a list of 63 recent books on air conditioning with particulars as to their contents, publishers and prices has been compiled in the Research plans and Publications Section of the National Research Council, Ottawa, Canada, and may be obtained from that office at twenty-five cents per copy. Standardisation of practice in air-conditioning is being brought about through the adoption of codes by municipalities, engineering organisations and others interested in this field. A compilation entitled "Air Conditioning Codes," has also been made by the Council and copies will be available shortly at twenty-five cents each.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

British India.—A well-established firm of agents at Bombay wishes to obtain the representation, on a commission or consignment basis, of United Kingdom manufacturers of lubricating oils, sanitary fluid, toilet soap for the Bombay Presidency. (Ref. No. 394.)

Belgium.—An agent established at Brussels wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of paint, enamel, varnish for Belgium. (Ref. No. 402.)

Holland.—A firm of agents established at Haarlem wishes to obtain the representation, on a commission basis or to purchase for own account, of United Kingdom manufacturers of chemicals for photographic purposes for Holland. (Ref. No. 403.)

Books Received

Fluorescence and Phosphorescence. By E. Hirschlaff. London: Methuen and Co., Ltd. Pp. 130. 3s. 6d.

Chemical Engineering Economics. By Chaplin Tyler. 2nd edition. London: McGraw-Hill Publishing Co., Ltd. Pp. 241. 18s.

Weekly Prices of British Chemical Products

NEARLY all sections of the general chemical market are receiving a steady flow of inquiry although the volume of orders actually placed is of moderate dimensions. A steady increase in new forward bookings continues to be the only feature and in many instances price fixing for contract renewals has yet to be announced. So far as general chemicals, rubber chemicals and wood distillation products are concerned, quotations continue unchanged and remain on a steady to firm basis. There are no price changes of any importance to report in the coal tar section, and quotations for nearly all products are well held. A small volume of contract inquiry has been circulating, but the position as a whole remains distinctly quiet. It is generally felt that a better export inquiry would lead the way to a substantial improvement.

MANCHESTER.—Generally steady price conditions still obtain on the Manchester market for heavy chemical products, and only in one or two instances is there much sign of weakness. In the majority of instances so far reported sellers are adhering to current levels in respect of forward bookings over the whole or part of next year, and there has been a fair response from buyers, although up to the present the volume of contract buying has probably been somewhat below what it was at this time last year. The demand for prompt parcels this week has been on moderate lines. Deliveries into consumption against existing commitments are fair, on the whole. The demand gor most descriptions of by-products continues quiet and occasional further slight easiness has been reported.

Price Changes

Rises: Acetone; Toluol; Mercury Compounds.

Falls: Copper Sulphate (Manchester); Cresylic Acid, 97/99%.

GLASGOW.—Business in general chemicals has been on a rather quiet scale during the week, both for home trade and export. Prices generally continue quite steady at about previous figures, with no important changes to report.

General Chemicals

ACETONE.—£39 to £43 per ton, according to quantity.

ACETIC ACID.—Tech, 80%, £30 5s. per ton; pure 80%, £32 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs. GLASGOW: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders. SCOTLAND: 10½d. to 1s. 0½d., containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey, £18 10s. per ton, d/d U.K. Fine white, 98%, £17 per ton, d/d U.K.

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM DICHROMATE.—8½d. per lb. d/d U.K.

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £11 per ton c.i.f., U.K. ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. MANCHESTER: White powdered Cornish, £16 per ton, ex store.

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. GLASGOW: £12 per ton.

BLEACHING POWDER.—Spot, 35/37%, £9 5s. per ton in casks, special terms for contracts. SCOTLAND: £9 per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. London.

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 4¼d. per lb. d/d station in single 70-lb. cylinders.

CHROMETAN.—Crystals, 2⅝d. per lb.; liquor, £13 per ton d/d station in drums. GLASGOW: 70/75% solid, £5 15s. per ton net ex store.

CHROMIC ACID.—10d. per lb., less 2½%; d/d U.K.

CHROMIC OXIDE.—11½d. per lb.; d/d U.K.

CITRIC ACID.—1s. 0¼d. per lb. MANCHESTER: 1s. 0¼d. SCOTLAND: B.P. crystals, 1s. 0¼d. per lb.; less 5%, ex store.

COPPER SULPHATE.—£18 5s. per ton, less 2% in casks. MANCHESTER: £19 10s. per ton f.o.b. SCOTLAND: £19 10s. per ton, less 5%, Liverpool in casks.

CREAM OF TARTAR.—100%, 92s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£20-£22 per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £3 17s. 6d. to £4 17s. 6d. per cwt. according to quantity; in drums, £3 10s. 0d. to £4 2s. 6d.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 9d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One-ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. GLASGOW: White crystals, £30; brown, £1 per ton less. MANCHESTER: White, £31; brown, £30.

LEAD, NITRATE.—£32 per ton for 1-ton lots.

LEAD, RED.—£31 15s. 0d. 10 cwt. to 1 ton, less 2½% carriage paid. SCOTLAND: £31 per ton, less 2½% carriage paid for 2-ton lots.

LITHARGE.—SCOTLAND: Ground, £31 per ton, less 2½%, carriage paid for 2-ton lots.

MAGNESITE.—Calcined, in bags, ex works, about £8 per ton. SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—Solid (ex wharf) £5 10s. per ton. SCOTLAND: £7 5s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 11d. per lb.; powder B.P., 6s. 1d.; bichloride B.P. (corros. sub.), 5s. 2d.; powder B.P. 4s. 10d.; chloride B.P. (calomel), 5s. 11d.; red oxide cryst. (red precip), 7s.; levig., 6s. 6d.; yellow oxide B.P. 6s. 4d.; persulphate white B.P.C., 6s. 1d.; sulphide black (hyd. sulph. cum. sulph. 50%), 6s. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NITRIC ACID.—Spot, £25 to £30 per ton according to strength, quantity and destination.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. GLASGOW: £2 9s. per cwt. in casks. MANCHESTER: £49 to £55 per ton ex store.

PARAFFIN WAX.—SCOTLAND: 3½d. per lb.

POTASH CAUSTIC.—Solid, £35 5s to £40 per ton according to quantity, ex store; broken, £42 per ton. MANCHESTER: £39.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. GLASGOW: 4¼d. per lb. MANCHESTER: £37 per ton.

POTASSIUM DICHROMATE.—5¼d. per lb. carriage paid. SCOTLAND: 5¼d. per lb., net, carriage paid.

POTASSIUM IODIDE.—B.P. 6s. 3d. per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity. GLASGOW: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9¼d. to 10¼d. per lb. SCOTLAND: B.P. Crystals, 10¼d. MANCHESTER: B.P. 9¼d. to 11¼d.

POTASSIUM PRUSSIATE.—5¾d. per lb. SCOTLAND: 6⅜d. net, in casks, ex store. MANCHESTER: Yellow, 6¼d. to 6¼d.

PRUSSIATE OF POTASH CRYSTALS.—In casks, 6¾d. per lb. net, ex store

SALAMMONIAC.—Firsts lump, spot, £42 17s. 6d. per ton, d/d address in barrels. Dog-tooth crystals, £36 per ton; fine white crystals, £18 per ton, in casks, ex store. GLASGOW: Large crystals, in casks, £37 10s.

SALT CAKE.—Unground, spot, £3 11s. per ton.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, 13s. 10s. per ton d/d station. SCOTLAND: Powdered 98/99%, £18 10s. in drums, £19 5s. in casks, Solid 76/77° £15 12s. 6d. in drums; 70/73%, £15 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts, 10s. per ton less.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£19-£20 per ton carriage paid North. GLASGOW: £18 10s. per ton net ex store.

SODIUM BICARBONATE.—Refined spot, £10 15s. per ton d/d station in bags. GLASGOW: £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags. MANCHESTER: £10 15s.

SODIUM BISULPHITE POWDER.—60/62%, £14 10s. per ton d/d in 2-ton lots for home trade.

SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.

SODIUM CHLORATE.—£27 10s. to £32 per ton. GLASGOW: £1 11s. per cwt., minimum 3 cwt. lots.

SODIUM DICHROMATE.—Crystals cake and powder 4½d. per lb. net d/d U.K. with rebates for contracts.

SODIUM CHROMATE.—4½d. per lb. d/d U.K.

4d. per lb. GLASGOW: 4½d. net, carriage paid.

SODIUM HYPOSULPHITE.—Pea crystals, £15 5s. per ton for 2-ton lots; commercial, £11 5s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.

SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.

SODIUM NITRATE.—Refined, £8 per ton for 6-ton lots d/d. GLASGOW: £1 12s. 0d. per cwt. in 1-cwt. kegs, net, ex store.

SODIUM NITRITE.—£18 5s. per ton for ton lots.

SODIUM PERBORATE.—10%, 9½d. per lb. d/d in 1-cwt. drums.

SODIUM PHOSPHATE.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £16 10s. per ton delivered per ton lots.

SODIUM PRUSSIATE.—...d. per lb. for ton lots. GLASGOW: 5d. to 5¼d. ex store. MANCHESTER: 4½d. to 5d.

SODIUM SILICATE.—£8 2s. 6d. per ton.

SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.

SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 12s. 6d.

SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.

SODIUM SULPHITE.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.

SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.

TARTARIC ACID.—1s. 1½d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1½d. per lb. GLASGOW: 1s. 1½d. per lb., 5%, ex store.

ZINC SULPHATE.—Tech., £11 10s. f.o.r., in 2 cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 6d. to 1s. 7½d. per lb.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARYTES.—£6 to £6 10s. per ton, according to quality.

CADMIUM SULPHIDE.—3s. 2d. to 3s. 5d. per lb.

CARBON BLACK.—3¾d. to 4 1/16d. per lb., ex store.

CARBON DISULPHIDE.—£31 to £33 per ton, according to quantity, drums extra.

CARBON TETRACHLORIDE.—£41 to £46 per ton, according to quantity, drums extra.

CHROMIUM OXIDE.—Green, 10½d. to 11½d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

INDIA-RUBBER SUBSTITUTES.—White, 4½d. to 5½d. per lb.; dark 3½d. to 4½d. per lb.

LAMP BLACK.—£24 to £26 per ton del., according to quantity. Vegetable black, £35 per ton upwards.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE.—Spot, 30%, £16 10s. per ton, 2-ton lots d/d in bags.

SULPHUR.—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.

SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quantity.

VERMILION.—Pale, or deep, 5s. per lb., 1-cwt. lots.

ZINC SULPHIDE.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1939; November, £7 8s.; December, £7 9s. 6d.; January, 1939; £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.

CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1939; November, £7 12s. 6d.; December, £7 13s. 9d.; January, 1939, £7 15s.; February, £7 16s. 3d.; March, £7 17s. 6d.; April/June, £7 18s. 9d.

NITRO CHALK.—£7 10s. 6d. per ton up to June 30, 1939.

SODIUM NITRATE.—£8 per ton for delivery up to June 30, 1939.

CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.

AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

BENZOL.—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4½d. to 1s. 5d., pure 1s. 8½d. to 1s. 9d. GLASGOW: Crude, 10d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 4½d. MANCHESTER: Pure, 1s. 8d. per gal.; crude, 1s. per gal.

CARBOLIC ACID.—Crystals, 6¾d. to 8½d. per lb., small quantities would be dearer; Crude, 60's, 1s. 7½d. to 1s. 10½d.; dehydrated, 2s. 6d. per gal., according to specification; Pale, 99/100%, per lb. f.o.b. in drums; crude, 2s. 1d. per gal.

CREOSOTE.—Home trade, 4d. per gal., f.o.r. makers' works; exports 6d. to 6½d. per gal., according to grade. MANCHESTER: 3¾d. to 4½d. GLASGOW: B.S.I. Specification, 6d. to 6½d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5¾d. to 6½d.

CRESYLIC ACID.—97/99%, 1s. 8d. to 1s. 11d.; 99/100%, 2s. 6d. to 2s. 8d. per gal., according to specification; Pale, 99/100%, 2s. 1d. to 2s. 3d.; Dark, 95%, 1s. 7d. to 1s. 8d. per gal. GLASGOW: Pale, 99/100%, 5s. to 5s. 6d. per gal.; pale, 97/99%, 4s. 6d. to 4s. 10d., dark, 97/99%, 4s. 3d. to 4s. 6d.; high boiling acids, 2s. to 2s. 6d. American specification, 3s. 9d. to 4s. MANCHESTER: Pale, 99/100%, 1s. 10d.

NAPHTHA.—Solvent, 90/160, 1s. 6d. to 1s. 7d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1d. to 1s. 3d. per gal., naked at works, according to quantity. GLASGOW: Crude, 6½d. to 7½d. per gal.; 90%, 160, 1s. 5d. to 1s. 6d., 90%, 190, 1s. 1d. to 1s. 3d.

NAPHTHALENE.—Crude, whizzed or hot pressed, £4 10s. to £5 10s. per ton; purified crystals, £11 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £3 to £4 10s. per ton. GLASGOW: Fire lighter, crude, £6 to £7 per ton (bags free). MANCHESTER: Refined, £12 to £13 per ton f.o.b.

PITCH.—Medium, soft, 31s. per ton, f.o.b. MANCHESTER: 30s. f.o.b., East Coast. GLASGOW: f.o.b. Glasgow, 35s. to 37s. per ton; in bulk for home trade, 35s.

PYRIDINE.—90/140%, 12s. to 14s. per gal.; 90/160%, 9s. 8d. to 10s. 6d. per gal.; 90/180%, 3s. to 4s. per gal. f.o.b. GLASGOW: 90% 140, 10s. to 12s. per gal.; 90% 160, 9s. to 10s.; 90% 180, 2s. 6d. to 3s. MANCHESTER: 11s. to 14s. per gallon.

TOLUOL.—90%, 1s. 11d. per gal.; pure 2s. 3d. GLASGOW: 90% 120, 1s. 10d. to 2s. 1d. per gal MANCHESTER: Pure 2s. 4d. per gallon, naked.

XYLOL.—Commercial, 1s. 11d. to 2s. per gal.; pure, 2s. 3d. to 2s. 3½d. GLASGOW: Commercial, 2s. to 2s. 1d. per gal.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £6 15s. to £9 5s. per ton; grey, £8 5s. to £8 10s. MANCHESTER: Brown, £8s. 10d.; grey, £9 15s.

METHYL ACETONE.—40.50%, £32 to £35 per ton.

WOOD CREOSOTE.—Unrefined, 6d. to 8d. per gal., according to boiling range.

WOOD NAPHTHA, MISCIBLE.—2s. 8d. to 3s. per gal.; solvent, 3s. 3d. to 3s. 6d. per gal.

WOOD TAR.—£3 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZIDINE, HCl.—2s. 7½d. per lb., 100% as base, in casks.

BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 11½d. per lb. d/d buyer's works.

m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.

o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.

p-CRESOL, 34-5° C.—1s. 7d. to 1s. 8d. per lb. in ton lots.

DICHLORANILINE.—2s. 1½d. to 2s. 5d. per lb.

DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.

DINITROBENZENE.—7½d. per lb.

DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.

DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 11d.

DIPHENYLAMINE.—Spot, 2s. 2d. per lb., d/d buyer's works.

GAMMA ACID, Spot, 4s. 4½d. per lb. 100% d/d buyer's works.

H ACID.—Spot, 2s. 7d. per lb.; 100% d/d buyer's works.

NAPHTHIONIC ACID.—1s. 10d. per lb.

β-NAPHTHOL —£97 per ton; flake, £94 8s. per ton.

α-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.

β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.

NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.

o-NITRANILINE.—4s. 3½d. per lb.

m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 10d. to 2s. 1d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.

NITRONAPHTHALENE.—9½d. per lb.; P.G., 1s. 0½d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.

SULPHANILIC ACID.—Spot, 8½d. per lb. 100%, d/d buyer's works.

o-TOLUIDINE.—10½d. per lb., in 8/10 cwt. drums, drums extra.

p-TOLUIDINE.—1s. 10½d. per lb., in casks.

m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

MANUFACTURE OF STEELS.—Soc. d'Electro Chimie, d'Electro Metallurgie, et des Acieres Electriques d'Ugine. (France, Nov. 10, '37.) 32573.

PREPARATION OF NEUTRAL FATS, ETC.—C. Schmidt (Schmidt). 31861.

MANUFACTURE OF CYCLOPENTANOPOLYHYDROPHENANTHRENE DERIVATIVES.—Soc. of Chemical Industry in Basle. (Switzerland, March 17.) 31852; (Switzerland, Sept. 27.) 31853.

DYEING, ETC.—Soc. of Chemical Industry in Basle. (Switzerland, July 8.) 31854; (Switzerland, Oct. 14.) 31855.

PLASTIC MATERIALS.—Carbide and Carbon Chemicals Corporation. (United States, Nov. 20, '37.) 31828.

PRODUCTION OF *a*-TETRAHYDRO-ρ-OXAZINO-ALKYL-ARYL OXYGEN COMPOUNDS.—Chemische Werke Albert. (Germany, Nov. 6, '37.) 32054; (Germany, Jan. 15.) 32055.

LUBRICANTS, ETC.—I. M. Colbeth. 32104.

PROCESS FOR THE RECOVERY OF GOLD.—H. Davies. 31868.

PREPARATION OF NITRILES.—E. I. du Pont de Nemours and Co. (United States, Nov. 6, '37.) 32027.

DERIVATIVES OF ρ-AMINO BENZENE-SULPHONAMIDE.—H. Fairbrother (Naamlooze Vennootschap Orgachemia). 32145.

HEAVY ALLOYS, ETC.—General Electric Co., Ltd., G. H. S. Price and S. V. Williams. 32515.

MANUFACTURE OF CONDENSATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) 32377.

METHOD OF MAKING ALLOYS OF IRON, ETC.—C. J. Head, and R. W. Howe. 32279.

COLORATION OF TEXTILE MATERIALS.—C. L. Hird. 32370.

STERILISATION OF LIQUIDS, ETC.—H. G. Hoare. 32157.

MANUFACTURE OF POROUS ARTICLES from synthetic resin impregnated fibres.—Hydro-Plastics, Ltd., H. W. Hutton, and G. R. Eyssen. 32217.

MANUFACTURE OF CONDENSATION PRODUCTS.—I. G. Farbenindustrie. (Germany, Nov. 3, '37.) 31897.

MANUFACTURE OF ACID VIOLET TRIARYLMETHANE DYESTUFFS.—I. G. Farbenindustrie. (Germany, Nov. 6, '37.) 32070.

POLYMERISATION OF ACTIVATED VINYL COMPOUNDS.—I. G. Farbenindustrie. (Germany, Nov. 6, '37.) 32141.

MANUFACTURE OF UNSYMMETRICAL TRIMETHINE DYESTUFFS.—I. G. Farbenindustrie. (Germany, Nov. 9, '37.) 32222; (Germany, July 27.) 32223.

MANUFACTURE OF SATURATED, ETC., COMPOUNDS of the bis-norcholanic acid and aetio-cholanic acid series, etc.—Soc. of Chemical Industry in Basle. (Switzerland, Nov. 9, '37.) 32224.

MANUFACTURE OF CARBONYL COMPOUNDS OF STEROIDS.—Soc. of Chemical Industry in Basle. (Switzerland, Nov. 12, '37.) 32378; (Switzerland, Sept. 30.) 32379.

GLUTAMIC ACID RECOVERY FROM SOLUTIONS.—Standard Brands, Inc. (Oct. 5, '37.) (United States, Oct. 15, '36.) 32028.

PREPARATION OF FERRIC CHLORIDE.—R. F. Stewart and Dorr-Oliver Co., Ltd. 32062.

METAL PASTE PIGMENTS.—Aluminium Co. of America. (United States, Nov. 11, '37.) 32688, 32689, 32690, 32691.

PRODUCTION OF PHENOL-ALDEHYDE SYNTHETIC RESINS.—Bakelite, Ltd. (Germany, Nov. 16, '37.) 33092.

PRODUCTION OF HOMOGENEOUS BINDER-LIKE MIXTURES of petroleum bitumen and coal tars, etc. Bauges Malchow Ges. (Germany, Dec. 11, '37.) 32726; (Germany, Jan. 11.) 32727; (Germany, Feb. 9.) 32728; (Germany, Feb. 17.) 32729, 32730.

Complete Specifications Open to Public Inspection

POLYVINYL ACETAL RESIN PLASTIC MATERIALS.—Libbey-Owens-Ford Glass Co. May 14, 1937. 25603/37.

WATERPROOFING OF FABRICS.—F. F. Schwartz, and M. A. Chavannes. May 14, 1937. 26002/37.

VULCANISATION OF RUBBER.—Wingfoot Corporation. May 8, 1937. 3526/38.

METHOD AND COMPOSITION FOR TREATING COAL.—Johnson-March Corporation. May 8, 1937. 4230/38.

MANUFACTURE OF CARBON TETRACHLORIDE.—I. G. Farbenindustrie. May 10, 1937. 10250/38.

INSECTICIDES.—Rohm and Haas Co. May 11, 1937. 10635/38.

PRODUCTION OF CARBONYL COMPOUNDS derived from sterols or analogous compounds.—Soc. of Chemical Industry in Basle. May 14, 1937. 10795/38.

PRODUCTION OF DEXTROSE HYDRATE.—International Patents Development Co. May 14, 1937. 12768/38.

PROCESS FOR THE MANUFACTURE OF NON-DISCOLOURING METAL SALTS of higher molecular organic acids.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. May 13, 1937. 12912/38.

PURIFICATION, CONCENTRATION, AND SEPARATION OF COLLOIDAL DISPERSIONS by electrophoresis.—Semperit Osterreichisch-Amerikanische Gummiwerke, A.-G. May 12, 1937. 13072/38.

PRODUCTION OF OLEFINE OXIDES.—U.S. Industrial Alcohol Co. May 8, 1937. 13755/38.

TREATMENT OF RUBBER.—United States Rubber Products, Inc. May 8, 1937. 13757/38.

MANUFACTURE OF POLYMERIC VINYL ALCOHOLS and partial derivatives thereof.—Chemische Forschungsges. May 10, 1937. 13798/38.

PROCESSING OF CALCINED PIGMENTS.—Bird Machine Co. May 10, 1937. 13951/38.

PROCESS FOR THE MANUFACTURE OF HYDROGENATED INDANEDIONES.—Schering, A.-G. May 10, 1937. 13965/38.

MANUFACTURE OF DYESTUFFS of the anthraquinone series.—Soc. of Chemical Industry in Basle. May 11, 1937. 14064/38.

MANUFACTURE OF OESTROGENIC COMPOUNDS.—Schering, A.-G. May 11, 1937. 14080/38.

ELECTROLYTIC REFINING OF ALUMINIUM.—Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges, et Camargue. May 14, 1937. 14317/38.

PROCESS FOR THE MANUFACTURE OF AROMATIC SULPHONIC HALIDE SULPHONIC ACIDS and salts thereof.—I. G. Farbenindustrie. May 13, 1937. 14340/38.

Specifications Accepted with Date of Application

CATALYTIC POLYMERISATION OF OLEFINES.—G. W. Johnson (I. G. Farbenindustrie.) March 4, 1937. 495,184.

PROCESS FOR THE MANUFACTURE OF POLYPHOSPHATES.—Chemische Werke Vorm. H. and E. Albert. April 11, 1936. 495,192.

MANUFACTURE OF VAT DYESTUFFS of the anthraquinone-acridone series.—W. W. Groves (I. G. Farbenindustrie.) May 5, 1937. 495,375.

MANUFACTURE OF DYESTUFFS of the triarylmethane series.—W. W. Groves (I. G. Farbenindustrie.) May 7, 1937. (Addition to 472,757.) 495,260.

PREPARATION OF PURIFIED NOBLE METALS.—Distillers Co., Ltd., H. Langwell, and J. F. Short. May 7, 1937. 495,262.

PAINTS.—J. G. Gaunt (La Synthetic). May 8, 1937. (Convention date not granted.) 495,436.

METHOD OF PREPARING HYDROCARBONS soluble in sulphuric acid.—F. Rostler, and V. Mehner. June 26, 1936. 495,323.

MANUFACTURE OF ORTHO-HALOGEN-ANTHRAQUINONE-β-CARBOXYLIC ACIDS.—I. G. Farbenindustrie. May 8, 1936. (Samples furnished). 495,380.

MANUFACTURE OF CALCIUM NITRATE from ammoniacal gases.—H. Pauling. May 10, 1937. 495,328.

PAINT BASE.—F. W. Corkery. May 11, 1937. 495,439.

MANUFACTURE OF COLLOIDAL SULPHUR and of insecticidal and fungicidal preparations thereof.—Lunevale Products, Ltd., and M. Fitzgibbon. May 11, 1937. 495,393.

PROCESS FOR THE MANUFACTURE OF ACID DYESTUFFS.—I. G. Farbenindustrie. May 12, 1936. (Samples furnished.) 495,395.

DEODORISATION OF AQUEOUS DISPERSIONS of polymerised chloroprene.—B.B. Chemical Co., Ltd., L. E. Puddefoot, and K. H. Elson. May 13, 1937. 495,263.

EXCHANGING IONS BETWEEN A SOLUTION AND AN ARTIFICIAL RESIN and manufacture of artificial resins therefor.—I. G. Farbenindustrie. Sept. 3, 1936. 495,401.

MANUFACTURE OF POLYMERISATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) May 13, 1937. 495,337.

EXCHANGING IONS BETWEEN A SOLUTION AND AN ARTIFICIAL RESIN, and manufacture of artificial resins therefor.—I. G. Farbenindustrie. Sept. 9, 1936. 495,402.

STABILISATION OF CHLORINATED PARAFFIN WAX.—T. N. Montgomery, and Imperial Chemical Industries, Ltd. May 13, 1937. 495,410.

PREPARATION OF BASIC LEAD SALTS of trinitro-*m*-cresol.—L. Rubenstein, and Imperial Chemical Industries, Ltd. May 13, 1937. 495,411.

ANTICRYPTOGAMIC PRODUCT adapted to generate colloidal sulphur in statu nascendi.—E. P. Bigourdan, and M. Mendelsohn. May 13, 1937. 495,113.

MANUFACTURE OF AROMATIC SULPHONIC ACIDS having capillary-active properties.—W. W. Groves (I. G. Farbenindustrie.) May 14, 1937. 495,414.

PLASTIC COMPOSITIONS.—A. E. Bond. May 27, 1937. 495,425.

PRODUCTION OF CHLORINE DIOXIDE.—Mathieson Alkali Works. June 17, 1936. 495,267.

CONVERSION OF OLEFINES into valuable high molecular weight products.—G. W. Johnson (I. G. Farbenindustrie.) June 14, 1937. 495,121.

MANUFACTURE OF 5-HALOGEN- and 5-hydroxy-trimellitic acids.—W. W. Groves (I. G. Farbenindustrie.) June 24, 1937. 495,432.

MANUFACTURE OF COMPLEX METALLIC COMPOUNDS.—B. H. Marsh, and D. W. Marsh. Oct. 15, 1937. 495,274.

METHOD OF PURIFYING AQUEOUS SOLUTIONS of titanium compounds.—H. G. C. Fairweather (Sherwin-Williams Co.). Feb. 4, 1938. 495,248.

PRODUCTION OF BITUMINOUS EMULSIONS.—H. E. Potts (Romag, A.-G. für Rohmaterialien). Oct. 20, 1937. 495,229.

RECOVERY OF ALCOHOLS.—Carbide and Carbon Chemicals Corporation. Nov. 25, 1936. 495,231.

MANUFACTURE OF THORIUM OXIDE and contact masses containing it.—Chemische Fabrik Von Heyden, A.-G. Oct. 29, 1936. 495,143.

STABILISATION OF DITHIOCARBAMATES.—Wingfoot Corporation. June 3, 1937. 495,247.

PRECIPITATING ZINC SULPHIDE.—Non-Ferrous Metal Products, Ltd. April 1, 1937. 495,277.

EXTRACTION OF WASTE AQUEOUS LIQUIDS containing phenols.—Chemische Fabrik Von. Heyden, A.-G. Feb. 26, 1937. 495,163.

PREPARATION OF NUCLEAR ALKYLATED ARALKYLATED OR ARYLATED DERIVATIVES OF ALKALOIDS of the morphine group.—W. U. Research Corporation, L. F. Small, and H. M. Fitch. May 5, 1937. (Samples furnished.) 495,251.

PRODUCTION OF CHLORITES.—Mathieson Alkali Works. April 1, 1937. 495,289.

MANUFACTURE AND PRODUCTION OF ZINC HYPOSULPHITE.—I. G. Farbenindustrie. April 20, 1937. 495,297.

Chemical and Allied Stocks and Shares

FOLLOWING a fairly general decline of values on the Stock Exchange better conditions developed towards the middle of the week. This was attributed to less anxiety regarding affairs in France, but was also due to the view that the recent statement of the Chancellor of the Exchequer may indicate that no increase in income tax will be made next year.

Most of the more active shares of companies associated with the chemical and kindred trades declined sharply on Monday, but later some recovery has been shown, and in many cases prices are little changed on balance. Imperial Chemical are 31s. 6d. at the time of writing, compared with 31s. 7½d. a week ago, and British Aluminium at 54s. 3d. show a decline of only 6d. Turner and Newall were a firmer market, awaiting declaration of the final dividend, and a fairly steady tendency was shown by Lever and Unilever ordinary units. On the other hand, Associated Cement have declined sharply, and despite a subsequent partial recovery are 75s. at the time of writing, which compares with 81s. 9d. a week ago. Most other cement shares have also moved against holders owing to fears that competition may increase if, as has been suggested, new producers enter the industry. British Plaster Board were steady, aided by the maintenance of the interim dividend.

Tube Investments declined moderately, despite the good impression created by the full results and the news of closer collaboration with Stewarts and Lloyds. The shares of the latter company were steady around 40s., but most shares of iron, steel and allied companies have made lower prices, although Dorman Long later showed a steadier tendency, pending the meeting. United Steel were dull, having remained under the influence of the news that the company's plans will require an increase in the issued capital. Murex at 78s. 9d. show a decline of 1s. 3d. on balance and Babcock and Wilcox at 37s. are 6d. lower. United Molasses made some improvement on consideration of the dividend, although following the announcement of the latter there was a decline in the shares as a larger increase in the dividend had been expected in some quarters of the market. Fison Packard and Prentice were again active and at 38s. 9d. are little changed as compared with a week ago. British Oil and Cake Mills preferred ordinary are 43s., compared with 43s. 9d. last week. Wall Paper deferred units were lower at 34s., but Pinchin Johnson, International Paint and other paint shares were fairly steady. Triplex Glass ordinary units continued to fluctuate fairly sharply and have moved down to 32s. 9d. at the time of writing. A week ago the price was 34s. Michael Nairn gained 1s. 3d. to 61s. 3d., but Barry and Staines were moderately lower.

Calico Printers, Bradford Dyers and numerous other textile shares lost part of the gains shown last week, when sentiment was influenced by the terms of the Anglo-American trade agreement. Courtaulds recovered part of an earlier decline, but British Celanese have been dull awaiting the report and accounts. Imperial Smelting were affected by the lower price of zinc and at 11s. 6d. are 1s. below the price current a week ago. Enfield Rolling Mills and Birmid Industries were fairly steady under the influence of the results. Boots Drug remained steady at 40s., while Timothy Whites and Taylors at 23s. 9d., were also unchanged. Sangers ordinary shares were again 21s. 9d., "Shell" and other leading oil shares were not very active, but the losses shown earlier in the week were partly reganid subsequently.

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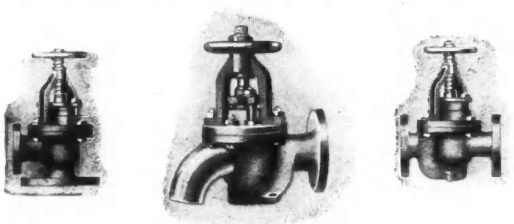

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Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

R. G. HARBOTT AND CO., LTD., London, E., manufacturing chemists. (M., 3/12/38.) Nov. 21, debenture to A. R. Cox, Smallburgh, securing £1,200 and further advances amounting therewith to £2,000; general charge.

R. S. DUFF, LTD., Leeds, soap manufacturers. (M., 3/12/38.) Nov. 21, £250 debentures; general charge. *Nil. Dec. 31, 1937.

Satisfactions

LA BARRE, LTD., Wolverhampton, enamel manufacturers. (M.S., 3/12/38.) Satisfaction Nov. 18, of debentures registered March 20, 1931, to the extent of £2,000.

SULFUROPHOSPHATE MANUFACTURING CO., LTD., Devonport. (M.S., 3/12/38.) Satisfactions Nov. 19, of debentures registered Feb. 26, 1937, to extent of £2,000 A and £4,200 B.

County Court Judgments

SONTAY LABORATORIES (firm), 20c Pimlico Road, S.W.1. (C.C., 3/12/38.) Manufacturing chemists. £26 7s. 6d. Oct. 7.

HOLE, SIDNEY, 32 Devonshire Buildings, Bath. (C.C., 3/12/38.) Analytical chemist. £12 16s. 4d. Oct. 5.

Receivers

BRITTOL SYNDICATE, LTD., Brentford, liquid fuel producers. (M., 3/12/38.) T. J. Swinney has ceased to act as receiver.

GOO-GOO PRODUCTS, LTD., manufacturers of and dealers in solvents, soaps, etc. (R., 3/12/38.) Sapphire Chemical Works, Whieldon Road, Stoke-on-Trent. Alan G. West, Leybourne House, Regent Street, Stoke-on-Trent, has been appointed receiver and manager on Nov. 15, 1938, under powers contained in debentures dated Jan. 26, 1937.

Forthcoming Events

London.

December 5.—Society of Chemistry Industry. Burlington House, W.1. 8 p.m. Joint Meeting with the Road and Building Materials Group. A. R. Astbury, "Building Materials in Relation to Air Raid Precautions."

Royal Society of Arts. John Street, Adelphi, W.C.2. 8 p.m. Cantor Lecture. J. H. Partridge, "Refractory Materials."

December 7.—Society for the Study of Alchemy and Early Chemistry. Queen Mary College, Mile End Road, E.1. 8 p.m. J. C. Gregory, "From Magic to Science."

Institute of Chemistry. 30 Russell Square, W.C.1. 8 p.m. 10th Gluckstein Memorial Lecture. Dr. W. H. Hatfield.

Society of Public Analysts and Other Analytical Chemists. Burlington House, Piccadilly, W.1. 8 p.m.

Institute of Metals. Joint Meeting with the London Branch, Institute of British Foundrymen. Charing Cross Hotel. 8 p.m. F. Hudson, "Modern Non-Ferrous Foundry Practice."

Institute of the Plastics Industry. Caxton Hall, Westminster, S.W.1. 7.30 p.m. Col. F. Reid, "What the G.P.O. requires from the Plastics Industry."

Royal Society of Arts. John Street, Adelphi, W.C.2. 8.15 p.m. Dr. E. F. Armstrong, "Standards of Quality and the Machinery for Establishing Them."

December 8.—Oil and Colour Chemists' Association (London Section). T. McLachlan, "Some Aspects of Mould Growths."

Royal Society. Pilgrim Lecture by Dr. I. Langmuir on Molecular Films.

December 9.—Royal Institution. 21 Albemarle Street, W.1. 9 p.m. Dr. I. Langmuir, "The Properties and Structure of Protein Films."

Birmingham.

December 7.—Society of Chemical Industry. Chamber of Commerce Buildings, New Street. 7.30 p.m. Dr. R. K. Schofield, "The Buffer Action of Finely Divided Solids."

Dublin.

December 7.—Institute of Chemistry. Trinity College. H. D. Thornton, "The Poulaphonca Scheme."

Edinburgh.

December 5.—Institute of Chemistry and Society of Chemical Industry. Scottish Dyes Recreation Hall, Grangemouth. 7.30 p.m. A. Clark Doull, "Brewing."

Leeds.

December 5.—Society of Chemical Industry. The University, Woodhouse Lane. 7.15 p.m. Professor H. L. Riley, "The Chemistry of Solid Carbon."

Manchester.

December 5.—The Chemical Society. The University. 7 p.m. Meeting for the reading of original papers.

December 7.—Institute of Metals. Blackfriars House, Blackfriars Street. 7.15 p.m. W. D. Jones, "Powder Metallurgy."

December 8.—Society of Chemical Industry (Plastics Group). L. Massey, "Plastics for Electrical Insulation."

December 9.—Oil and Colour Chemists' Association. Constitutional Club, St. Ann Street. 7 p.m. A. E. Bevan, "Emulsion Paints."

Newcastle.

December 7.—Society of Chemical Industry. Symposium, Coal Treatment and Utilisation.

Swansea.

December 9.—Institute of Chemistry (South Wales Section). Hotel Metropole. 7 p.m. Professor A. C. G. Egerton, "Engine Knock and Its Effect on Fuel Development."

Company News

Clover Paint and Composition Co., Ltd., have declared an interim dividend of 2½ per cent., less tax (same).

United Molasses Co., Ltd., have declared a dividend of 15 per cent. on the ordinary shares, making 22½ per cent. (21¼).

British Tar Products, Ltd., report for the year to September 30, 1938, a net profit of £50,707 (against £64,009). The meeting is on December 15, at Charing Cross Hotel.

Griffiths Hughes Proprietaries, Ltd., manufacturing chemists, have declared an interim dividend on the ordinary shares for the year ending March 31 of 2½ per cent., less tax, payable December 31.

British Benzol and Coal Distillation, Ltd., have declared a final dividend of 10 per cent. (same) together with a bonus of 5 per cent. (2½ per cent.) payable on December 31. The meeting is on December 15.

United Molasses Co., Ltd., report a trading profit for the year to September 30 of £1,045,977 (£1,014,054). Net profit was £43,873 higher at £672,013. The ordinary dividend is raised by 1¼ per cent. to 22½ per cent. (21¼ per cent.).

Midland Chemical Co., Ltd., have increased their nominal capital by the addition of £1,400 beyond the registered capital of £600. The additional capital is divided into 700 ordinary shares of £1 and 1,400 7 per cent. cumulative preference shares of 10s.

Tate and Lyle, Ltd., in the year to October 1 last, report that net profits amount to £1,260,590 (£1,227,553), total income £1,357,884 (£1,325,362), general reserve £300,000 (same), carry forward £52,290 (£46,227). As previously stated the year's dividend is 18¼ per cent., less tax (same).

British Industrial Plastics, Ltd., report gross profits of £97,565 (£105,569), and net profits of £22,185 (£31,098), after allowing £21,331 (£22,557) for depreciation and tax reserves. A dividend of 6 per cent. (8 per cent.) has been declared and £5,697 (£4,172) carried forward.

Associated Dyers and Cleaners, Ltd.—The offer made by Johnson Brothers (Dyers), Ltd., to acquire, for cash, the whole of the issued capital of Associated Dyers and Cleaners, Ltd., has been accepted by the shareholders of over 90 per cent. of the issued share capital of the company.

Zinc Corporation, Ltd., have announced that the second half of the fixed cumulative dividend on the preference shares for the year to December 31, and an interim participating dividend of 7½ per cent. on the preference and 15 per cent. on the ordinary shares will be paid, less tax at 3s. 2d. in the £ on January 2.

British Celanese, Ltd., report for the year to July 2 a decline in trading profits from £2,195,760 to £1,939,468. General sales and administrative experience take £1,068,902 (£1,073,610), research and advertising expenditure and additions to patent rights written off £248,670 (£239,991), depreciation £346,394 (£350,000), carry forward £259,692 (£295,536), net profits £29,781 (£247,078). With £295,536 brought forward from last year, a balance of £325,317 is available. The directors report that the company has established contact with Courtaulds, Ltd., to "discuss various matters of mutual interest." While such discussions are still in progress both parties have agreed that it would be inadvisable to make further reference to these discussions at the present time.